Route 79 / Davol Street Corridor Study

Executive Summary

Introduction

The Route 79 / Davol Street Corridor Study is an effort by the Massachusetts Department of Transportation (MassDOT) to undertake a comprehensive review of the transportation network in the Route 79 / Davol Street corridor, which runs along the eastern bank of the Taunton River in Fall River, Massachusetts. The main purpose of the study is two-fold: to identify transportation improvements within the corridor that will facilitate economic development of the City of Fall River's waterfront and to increase or balance overall mobility and access for all users of the study area transportation corridor – motor vehicle drivers, public transit riders, pedestrians, and bicyclists. As a product of this study, the recommendations focus on transportation solutions that can provide mobility and access in all modes and improve the livability and economic opportunities within the study area neighborhoods, with the recognition that not all traffic congestion issues can be eliminated entirely.

Over the past several years, the City of Fall River Redevelopment Authority (FRRA) and the Fall River Office of Economic Development (FROED) have completed a number of studies addressing the City's vision of revitalizing its waterfront. The most recent studies include the 2002 Fall River Harbor and Downtown Economic Development Plan prepared for FROED and the 2008 Route 79/Davol Street Transportation Study prepared for FRRA. This current MassDOT Route 79 / Davol Street Corridor Study builds on the 2008 FRRA study, evaluates additional alternatives in greater detail, and broadens its objectives.

The study encompasses five tasks:

- Task 1 – Study Area, Goals & Objectives, Evaluation Criteria, & Public Involvement
- Task 2 – Existing Conditions and Issues Identification
- Task 3 – Alternatives Development
- Task 4 – Alternatives Analysis
- Task 5 – Recommendations

Study Area

The study area for the Route 79 / Davol Street Corridor Study consists of two levels: (1) the Focus Area, which comprises the area in which potential transportation improvements are to be considered, and (2) the larger Regional Transportation Impact Area, which includes major intersections and roadways that affect the Focus Area and that may be impacted by any of the developed alternatives.

The Focus Area includes the Route 79 and Davol Street corridors along the Taunton River. The limits of the Focus Area are north of Brightman Street up to but not including the interchange with the Veterans Memorial Bridge to the north and Cedar Street to the south. The Focus Area, i.e. the area in which the study team is evaluating motor vehicle, pedestrian and bicycle operations under a range of roadway configurations and development scenarios, is illustrated in Figure ES-1.

The purpose of establishing the Regional Transportation Impact Area is to enable the study team to:

- Better understand the role and function of the transportation infrastructure in the Focus Area as it relates to the regional transportation network, and

- Evaluate the indirect impacts of study alternatives beyond the Focus Area.

The Regional Transportation Impact Area is comprised of a triangle formed by three major highways on the Fall River side of the Taunton River: Route 24 on the east, Route 79 on the west and I-195 on the south. On the Somerset side it includes U.S. Route 6 and I-195, roadways that could be affected by potential traffic diversions under various alternatives. The Regional Transportation Impact Area is illustrated in Figure ES-2.

Figure ES-1: Focus Area

Specifically excluded from the study area is the interchange of I-195 with Route 79. This interchange is being reconstructed as part of the MassDOT Accelerated Bridge Program under a separate Design-Build contract with a substantial completion date of 2016. To avoid duplication of effort, the Federal Highway Administration required that the I-195/Route 79 Interchange Project not be combined or overlap with any projects that may evolve from this study. This study incorporates the planned improvements at this interchange into the future conditions evaluation.

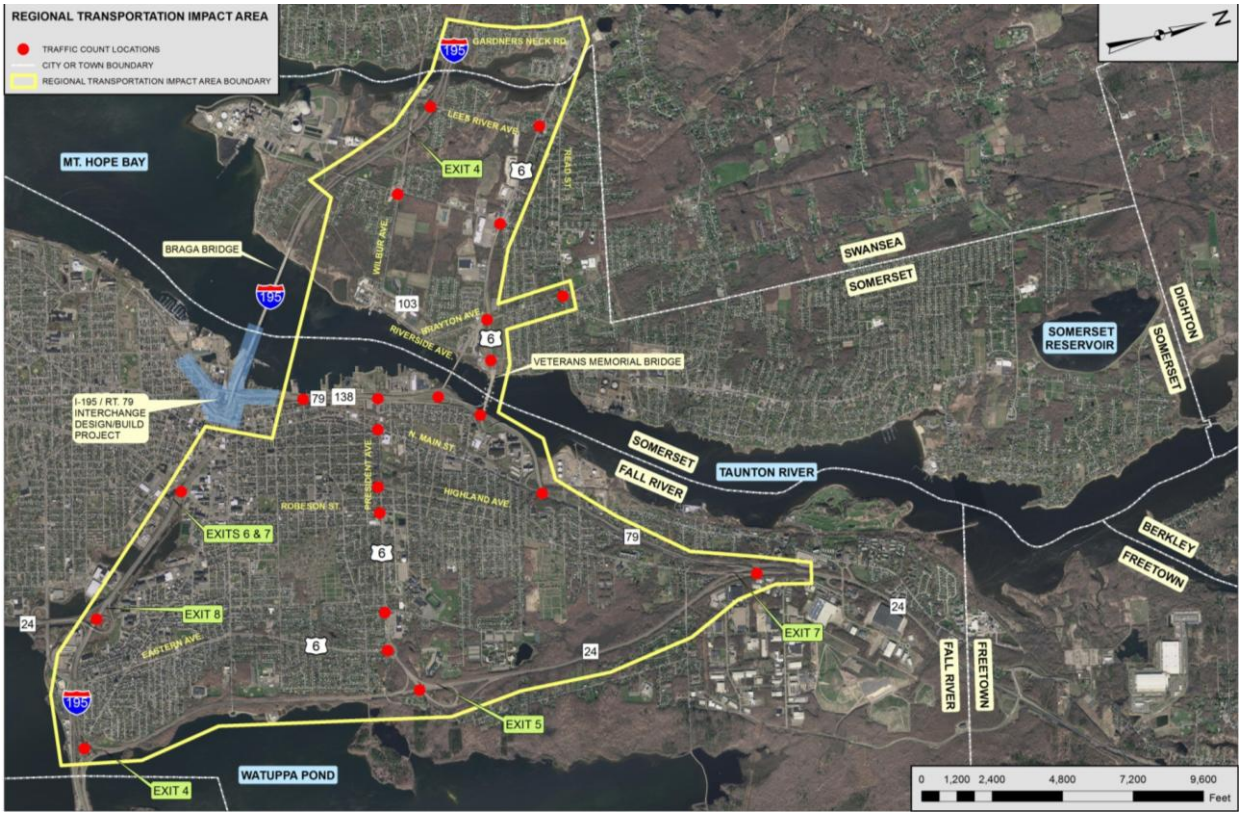


Figure ES-2: Regional Transportation Impact Area

Goals and Objectives

Goals and objectives for the study were developed by MassDOT through the public involvement process. The goals are meant to define the desired outcomes of the study in a concise manner. The objectives describe how these goals will be accomplished. Together, the goals and objectives shape the overall study framework, which guides the development and assessment of potential transportation improvements.

The Goals and Objectives for the study area are listed below:

Goal: Improve mobility, connectivity, and safety for all transportation modes and users along and across the Route 79 and Davol Street corridor study area.

Objectives:

- Provide new connections between Fall River neighborhoods and its waterfront
- Provide ADA-compliant pedestrian facilities throughout the project limits, including access to the future South Coast Rail
- Introduce bicycle accommodations throughout the project, including connection to the Veterans Memorial Bridge shared use path and access to the future South Coast Rail
- Maintain acceptable levels of service at both regional and local levels
- Implement measures to improve safety at high crash locations

Goal: Promote and foster local and regional economic development potential.

Objectives:

- Create new development parcels
- Provide access to development parcels
- Facilitate economic vitality and attractiveness of parcels through efficient access
- Develop roadway infrastructure that will support the desired development size and mix

Goal: Improve the quality of life for residents of surrounding neighborhoods and throughout Fall River.

Objectives:

- Provide new neighborhood connections to the waterfront
- Integrate circulation with reconfigured roadways and new development parcels
- Provide opportunities for enhancing attractiveness of the waterfront by improving aesthetics within the corridor
- Provide fair and equitable treatment for Environmental Justice population
- Minimize air quality impacts
- Provide access to the future South Coast Rail station

Evaluation Criteria

The evaluation criteria are specific considerations, or measures of effectiveness, used to assess benefits and impacts of alternatives developed during the study. The evaluation criteria are based on the defined goals and objectives. As shown in Table ES-1, six general evaluation categories were established and confirmed through the public involvement process to be consistent with the study goals and objectives:

Table ES-1: Evaluation Criteria Categories and Corresponding Goals

Evaluation Criteria Category	Corresponding Project Goal
Mobility	Improve mobility, connectivity, and safety for all transportation modes and users along and across the Route 79 and Davol Street Corridor Study area
Safety	
Land Use and Economic Development	Promote and foster local and regional economic development potential
Health and Environmental Effects	Improve the quality of life for residents of surrounding neighborhoods and throughout Fall River
Community Effects	
Cost	A key factor supporting all project goals

These evaluation criteria, which are based on either quantifiable or more subjective qualitative measures of effectiveness, have been used to determine the best solutions for the defined goals and objectives.

Public Involvement Plan

A public involvement plan developed to support civic engagement in the study emphasizes the following principles:

- The public shall have access to information about the study
- The public shall be presented with clear information
- The public shall be able to engage with a responsive study team
- The public shall be able to participate in a process that is well coordinated
- All public outreach shall be conducted in a manner that is inclusive and sensitive

Specific elements of the Public Involvement Plan include:

- Study Working Group

  A Working Group was created to guide the planning process for the Route 79 / Davol Street Corridor Study. Stakeholders/interests represented on the Working Group include the project area neighborhood advocacy groups, bicycling advocates, regional planning and transit agencies, environmental/water resources groups, recreation and municipal entities, state and federal government (elected officials and staff). Eight Working Group meetings were held:

  - Working Group Meeting #1: September 19, 2012
  - Working Group Meeting #2: December 6, 2012
  - Working Group Meeting #3: March 5, 2013
  - Working Group Meeting #4: May 29, 2013
  - Working Group Meeting #5: June 27, 2013
  - Working Group Meeting #6: November 7, 2013
  - Working Group Meeting #7: December 19, 2013
  - Working Group Meeting #8: May 7, 2014

- Public Meetings

  The study team conducted two public meetings during the course of the project development:

  - Public Informational Meeting #1: March 21, 2013
  - Public Informational Meeting #2: November 21, 2013

- Outreach to Environmental Justice Communities

  Special efforts were made to engage and communicate with Environmental Justice populations in the Route 79/Davol Street Corridor Study area. Representatives of six Environmental Justice groups joined the study Working Group. Project information was communicated to the public in Portuguese, English and Spanish languages.

- Project Website

MassDOT developed and maintained an interactive website as a way to support the study's public participation efforts: http://www.massdot.state.ma.us/route79.

- Newsletters / Fact Sheets

  The Study Team published and distributed periodic updates in a newsletter or fact sheet format.

- Media Coordination / Other Communication Networks

  The Study Team reached out to the media in advance of public meetings. Local news outlets that received information included newspapers, radio, and television. In addition, the study team reached out to other communication networks within the City of Fall River.

Existing Conditions

Evaluation of existing conditions encompassed environmental conditions, land use, socio-economic data, and multimodal transportation, including vehicles, pedestrians, bicycles and transit. Through the assessment of these factors, further validated by the future conditions analysis, the study identified issues, constraints and opportunities to be explored during development and analysis of alternatives. The most relevant highlights of each category are summarized below.

Environmental

The Taunton River

The most prominent natural resource within the project study area is the Taunton River, which lies just to the west of Route 79. In 2009, the entire 40-mile stretch of the Taunton River from the Town of Bridgewater, south to its confluence with Mt. Hope Bay, was officially designated as part of the National Wild and Scenic Rivers System. Within the vicinity of the project Focus Area, the Taunton River has three bridge crossings: the Braga Bridge along I-195, the former Brightman Street Bridge that is now closed to traffic, and the Veterans Memorial Bridge which was completed in 2011 to replace the Brightman Street Bridge.

Floodplain

The only floodplain resources located within the study area are associated with the Taunton River. The 100-year floodplain covers much of the land west of Route 79 and Davol Street West but also extends further to the east as far as the railroad tracks at the southern limits of the Focus Area. The 500-year floodplain extends further inland than the 100-year floodplain in a few isolated areas and encroaches onto Route 79 near President Avenue.

Hazardous Waste Sites

A review of hazardous materials GIS data for the project area identified the locations of two Activity and Use Limitations (AUL) sites. One of these sites recorded a small spill of fuel oil in 1995. The other one reported a release of aromatic hydrocarbons in 2003.

Protected and Recreational Open Space

There is a public park known as Veterans Bicentennial Park located within the study area, between Davol Street West and the Taunton River. The park falls under Section 4(f) of the Department of Transportation Act of 1966.

Environmental Justice Populations

Both low-income and minority populations live in or near the project study area. Review of census data indicated a large percentage of the population, approximately one-quarter, considered Portuguese as their primary language.

Socio-Economic

Demographic Trends

Fall River's population has fallen 3% between 2000 and today, compared to a 1% loss statewide. Roughly one-fifth of Fall River's population is foreign-born and one-third speaks a language other than English at home. Within the study Focus Area, the population is estimated to be 200 people. Nearly 90% of residents live in the waterfront Point Gloria Condominiums.

Economic Characteristics

Fall River's civilian labor force has dropped by 3% during the past decade. The median household income in the City rose by 18% since 2000, but is still roughly half of the State average. The percentage of households below poverty level rose from 16% to 20% over this timeframe and is significantly higher than the Massachusetts average 11% poverty rate.

Housing Stock

While total housing units in Fall River have slightly increased over the decade, the portion of owner occupied housing has decreased. Average housing values in the City climbed by 36% to approximately half the statewide average. Just 2% of owner-occupied housing is vacant, compared with 10% of rental housing. A good supply of rental housing is a positive condition for economic growth as it means that there are ample affordable housing choices for new workers entering the community.

Commercial Real Estate Market Trends

Sale prices for industrial properties in the City peaked in late 2007 and have since decreased, consistently with the statewide trends. Asking prices for industrial buildings are averaging approximately 15% below the statewide average. Asking prices for office space in Fall River have fallen since 2006 by 25% as compared to 15% at the state level. Due to the newly converted Commonwealth Landing Mill, there is an excellent supply of office space for rent in the study area. Retail prices in Fall River have been relatively stable over the past six years.

Land Use

Route 79 is located along the western side of the City of Fall River, an urban area. On a regional scale, the land use east of Route 79 is predominantly high-density residential with some commercial and industrial properties interspersed. To the south and east, the land use includes two historic districts, Highlands and Lower Highlands. The land to the west of Route 79 varies widely and includes commercial properties, apartments and condominiums, industrial sites, parkland and a boardwalk along the edge of the Taunton River.

Within the Focus Area industrial uses are the most dominant, occupying over 35% of study area acreage. Retail represents 22% of land uses with office at 9% of the total acreage and residential land uses at 7% are the sparsest.

Transportation

Vehicular Traffic

Major north-south roadway facilities within the Focus Area include Route 79, Davol Street East (northbound) and Davol Street West (southbound). President Avenue (U.S. Route 6) is the only east-west roadway crossing under Route 79. Two underpasses, one near Cory Street and another one near Cedar Street, as well as an overpass near Brightman Street accommodate u-turns between northbound and southbound Davol Street. Both Route 79 and President Avenue are on the National Highway System.

Route 79 carries approximately 26,000 vehicles per day (vpd) with southbound direction being the predominant movement during both morning and afternoon peak periods (approximately 55/45 southbound/northbound split).

Davol Street East carries approximately 15,000 vpd in the northbound direction and Davol Street West about 11,000 vpd in the southbound direction. Traffic volumes are split almost equally between the two roadways during the morning peak period and are much more pronounced in the northbound direction in the afternoon with a roughly 60/40 northbound/southbound split.

President Avenue daily volume is approximately 18,000 vpd with a distinct directional eastbound/westbound distribution of 60/40 in the morning and a slightly more balanced 55/45 split in the afternoon.

Operationally, all roadway segments and ramps within both the Focus Area and the Regional Transportation Impact Area operate at Level of Service (LOS) D or better with Route 79 operating at LOS A, which indicates availability of extra capacity. All intersections within the Focus Area operate at LOS C or better.

Pedestrians and Bicyclists

The Route 79 and Davol Street corridor presents a barrier impeding pedestrian access to the waterfront. There is only one east-west pedestrian connection across Route 79 within the Focus Area at President Avenue. This crossing features narrow 5-foot sidewalks, lacks lighting and in general is not a pleasant pedestrian environment. The next closest pedestrian link to the waterfront is approximately one mile to the south near I-195 at Central Street. The sparse east-west pedestrian crossings may encourage local residents to drive to the waterfront, rather than walk. While sidewalks are present along Davol Street, many locations lack ADA-compliant accessible ramps meeting the current standards. Most crossings at side streets do not have designated crosswalks.

There is a wooden boardwalk along the waterfront which starts at Fall River Heritage State Park and continues for 1/2 mile to the north. At this point is becomes a paved path, which connects to and through Bicentennial Park. There are currently no accommodations to walk further north along the waterfront.

Many Fall River streets are generally suitable for bicycling given typically slow urban traffic speeds on narrow rights-of-way. Although it is currently used by bicyclists, the Department of Conservation and Recreation (DCR) prohibits bicycling on the boardwalk that begins at Fall River Heritage State Park because the boardwalk does not meet bicycling design standards.

The Veterans Memorial Bridge has a shared-use path on the north side. On the Fall River side this path ends at Wellington Street. The City has provided signs for an on-street bike route between Wellington Street and President Avenue. Once at President Avenue, the bike route does not connect to any other bicycle facilities, requiring bicyclists to ride in the roadways undesignated for bicycle use or dismount and walk with their bike along the sidewalk.

Transit

Local transit service in the Fall River area is provided by the Southeastern Regional Transit Authority (SRTA). SRTA Route 2 operates in the Focus Area with a stop at Commonwealth Landing.

Safety Deficiencies

Five intersections within the Focus Area and one intersection immediately east of the Focus Area experience crash rates above the statewide and District 5 average rates. These intersections are:

- Southbound Davol Street at U-turn near Cedar Street
- Northbound Davol Street at U-turn near Cedar Street
- Northbound Davol Street at President Avenue
- President Avenue at Lindsey Street
- Lindsey Street at Brownell Street
- President Avenue at North Main Street

There have also been three crashes over a three-year period involving pedestrians, two of them at the Lindsey Street intersection with President Avenue.

Future No-Build Conditions

Future No-Build Conditions were analyzed for the Regional Transportation Impact Area and the Focus Area for the year 2035. Traffic projections were based on the travel demand forecasting model developed by Central Transportation Planning Staff (CTPS). The forecasts include economic development changes planned regionally and within the Focus Area. Specifically, within the Focus Area they include the development of South Coast Rail, the Regatta Club, Marina at City Pier, Commonwealth Landing Mill, and a restaurant on Remington Avenue. The Future No-Build Conditions also assume completion of the I-195/Route 79 Interchange Project.

It is anticipated that the Route 79/Davol Street corridor will experience a modest traffic growth of 0.6% - 1% annually over the 20-year period with general travel patterns remaining similar to existing.

Operationally, most locations within the Regional Transportation Impact Area and the Focus Area will continue to operate at acceptable levels of service (LOS D or better), with some degradation at several intersections along President Avenue to LOS E. Route 79 will continue to exhibit excess capacity operating at LOS A and LOS B.

Issues, Constraints and Opportunities

Assessment of the existing and future no-build conditions in the Regional Transportation Impact Area and the Focus Area led to identification of a number of issues, constraints and opportunities that guided the development of alternatives. The following is a synopsis of these considerations.

Mobility

The main mobility issue within the Focus Area is limited connectivity between the Fall River neighborhoods and the Taunton River waterfront. Route 79 is a visual and physical barrier

allowing vehicular and pedestrian access only at President Avenue. There are several local street crossings under or over the railroad east of Davol Street, which provides an opportunity to explore extending these streets across Route 79 towards the waterfront. The excess capacity of Route 79 opens up a possibility of introducing these crossings via at-grade intersections. The associated potential reconfiguration of Route 79 allows consideration of restoring Brightman Street access to southbound Route 79 and Davol Street, lost several years ago as a result of the Veterans Memorial Bridge construction.

Pedestrians and Bicyclists within the Focus Area have limited options when traveling between Fall River and the waterfront. The only designated east-west crossing within the Focus Area at President Avenue is nearly one mile north of the next crossing at Central Street near I-195. The existing shared-use path that crosses the Veterans Memorial Bridge ends at Wellington Street and bicyclists then must travel through small local streets. Provision of additional east-west connections and roadway reconfiguration introduces an excellent opportunity to establish a continuous network of dedicated pedestrian and bicycle facilities throughout the Focus Area.

Completion of South Coast Rail and Fall River Depot will promote transit oriented development opportunities within the Focus Area. This presents a prospect of expanding or modifying public transit routes on the SRTA to provide better service to South Coast Rail and developments within the Focus Area.

Safety

Several intersections within the Focus Area have high crash rates. To a large degree, these crashes are related to poor site distance, lack of adequate provisions for pedestrians and bicyclists, and ineffective traffic signal phasing. Some of these deficiencies could be remedied in short-term with signage, pavement markings, and traffic signal modifications, supplemented by upgrades bringing the intersections to compliance with ADA provisions. A more extensive reconfiguration of Route 79 and local streets introduces an opportunity to further alleviate safety problems.

Land Use and Economic Development

The parcels along the eastern side of Davol Street East are shallow as they are bound by the street and the railroad, which limits their attractiveness for large-scale development. On the west side of Davol Street West, there are a number of underutilized sites as well as Bicentennial Park, a 4(f) parkland. Also on the west side is Commonwealth Landing, a development featuring successful restaurants and offering office and residential space which could act as a catalyst for other developments along the waterfront.

Health and Environmental Effects

The City of Fall River maintains a combined sewer system (storm water and sanitary sewer) that outlets into the Taunton River. Reconfiguration of roadways within the Focus Area provides an opportunity to introduce Low Impact Design (LID) standards and Best Management Practices (BMP) for drainage, thus mitigating this condition. The Taunton River is designated as wild and scenic river and is a rare species priority habitat. This encourages the public to learn about the river and also promotes recreational use of the river.

The 100-year and 500-year floodplain is located along the Taunton River and across the area near the southern limits of the Focus Area. The presence of flood plain coupled with considerations of climate change and potential sea level rise impacts the final Route 79 elevation.

Roadway reconfiguration also provides an opportunity to introduce a network of shared-use paths, promoting better health by encouraging the community to use alternative modes of transportation including walking and bicycling.

The Focus Area offers many opportunities within its existing conditions and through redevelopments that are planned or are ongoing. The waterfront is becoming a regional draw for commercial and residential developments, and the opportunity to reconfigure the Route 79 and Davol Street Corridor will improve safety and circulation for all modes of transportation and will encourage further development along the waterfront and in Fall River. Completion of the South Coast Rail will provide transit oriented development opportunities

Alternatives Development

The development of alternatives was guided by the identification of the issues, constraints, and opportunities within the Focus Area, along with the goals and objectives established in the early stages of the study. The Working Group also provided significant input into the process. Initially, twelve conceptual alternatives were developed and grouped into three broad families of alternatives:

- Alternatives Group 1 – Elevated Limited Access Route 79
- Alternatives Group 2 – At-Grade Route 79 (Urban Boulevard)
- Alternatives Group 3 – At-Grade Route 79 with Frontage Roads

The concepts varied with regard to roadway alignment, which considered shifting Route 79 to the east and to the west; number and location of east-west connections; extents of Davol Street East and Davol Street West; one-way vs. two-way roadways; and access to and from Brightman Street. Through the process of refining these concepts and with continuous input from the Working Group, three long-term alternatives, one from each Alternatives Group, evolved that offered the best match with the project goals and objectives. Brief descriptions of these alternatives follow.

Alternative 1 - Elevated Route 79 with Cross Connections

This alternative, shown in Figure ES-3, features Route 79 relocated east of its existing alignment. Route 79 would remain a limited access highway with overpasses at three new east-west crossings at Turner Street, Taylor Street/Fall River Depot Driveway, and Brownell Street. The existing President Avenue crossing would be maintained as well. Due to close spacing of these overpasses, Route 79 would remain elevated throughout its length in the Focus Area. Similar to existing highway, Route 79 would carry two lanes in each direction with ramps connecting it to Veterans Memorial Bridge and Davol Street. Brightman Street would be restored to a two-way roadway and would allow direct access to and from northbound Route 79 and Davol Street East. Davol Street East and Davol Street West would generally remain on their current alignments with new parcels of land created between Route 79 and Davol Street West.

A 15-foot wide shared-use path would be provided along the eastern side of Davol Street East and along the western side of Davol Street West. The two paths would be connected at every east-west crossing and the easterly path would also connect to the Veterans Memorial Bridge shared-use path.

Alternative 2 - At-Grade Urban Boulevard

Alternative 2 would change the character of Route 79 to an urban boulevard lowered to an approximate level of Davol Street East and President Avenue. It would feature a wide landscaped median, and would provide local access to the waterfront and Route 79 via new signalized intersections at Turner Street, Taylor Street/Fall River Depot Driveway, President Avenue, and Cory Street (See Figure ES-4). Route 79 would be shifted to the east where it would follow the current alignment of Davol Street East. It would carry three through lanes in each direction with turning lanes at the intersections. The U-turn near Cedar Street would be eliminated since it would be replaced by Turner Street. Davol Street West would be converted to a two-way roadway. The ramp configuration from northbound Route 79 to the Veterans Memorial Bridge would be modified to allow access from Brightman Street, which would be restored to two-way operation. New parcels would be created between Route 79 and reconfigured Davol Street West.

A 15-foot wide shared-use path would be provided along the eastern side of northbound Route 79 connecting to the existing Veterans Memorial Bridge shared-use path, and along the west side of Davol Street West. Connections between the two paths would be provided along all east-west roadways.

Alternative 3 - At-Grade Route 79 with Frontage Roads

Alternative 3 would lower Route 79 to the same elevation as Davol Street East and President Avenue, and realign it to the east adjacent to Davol Street East (see Figure ES-5). It would provide one-way frontage roads on either side of Route 79 for local access. Route 79 would carry two through lanes in each direction separated by a landscaped median. East-west

connections would be provided via signalized intersections at the U-turn near Cedar Street, Turner Street, Taylor Street/Fall River Depot Driveway, President Avenue, and Cory Street which . Left turns from Route 79 would be prohibited and local access would be accomplished via ramps at the northern and southern ends of the Focus Area. New parcels would be created between Route 79 and southbound frontage road. The U-turn near Brightman Street would be eliminated in order to open up an additional parcel of land near the old Brightman Street Bridge. Similar to Alternative 2, the Route 79 northbound ramp to Veterans Memorial Bridge would be modified and Brightman Street would be restored to two-way operation.

A 15-foot wide shared-use path would be provided along the eastern side of Davol Street East connecting to the Veterans Memorial Bridge shared-use path, and along the western side of Davol Street West. Connections between the two paths would be provided along all east-west roadways with the exception of the U-turn near Cedar Street.

Federal Highway Administration Review

The Federal Highway Administration (FHWA) after reviewing Alternatives 1, 2 and 3 provided additional input on the alternatives development process. Through this review, it was recommended to consider modifying Alternative 2 to provide a narrower cross-section and smaller intersections along Route 79. It was also recommended that Davol Street West be removed or shortened. From this input, Alternative 2 – Modified was developed (see Figure ES-6).

Alternative 2 – Modified was based on Alternative 2 with the following changes:

- The Route 79 mainline would be reduced from three lanes to two lanes in each direction.
- Davol Street West would be truncated to provide only local access and discontinued as a through roadway with isolated segments providing access to existing parcels and businesses.

In addition to the long-term alternatives, a number of short-term and medium-term improvements have been identified through the alternatives development process and input from the Working Group. The focus of these improvements was primarily on enhancing safety and bicycle circulation within the Focus Area. These improvements are as follows:

Short-Term Improvements

- Davol Street U-turn near Cedar Street: clear vegetation to improve sight distance and provide striping and singing to better warn delineate merging maneuvers
- President Avenue at Davol Street East and Lindsey Street Intersection: install signs and pavement markings to improve pedestrian visibility and safety. Upgrade accessible ramps and traffic signals to ADA standards.

Figure ES-3: Final Alternative 1 Used for Analysis

Figure ES-4: Final Alternative 2 Used for Analysis

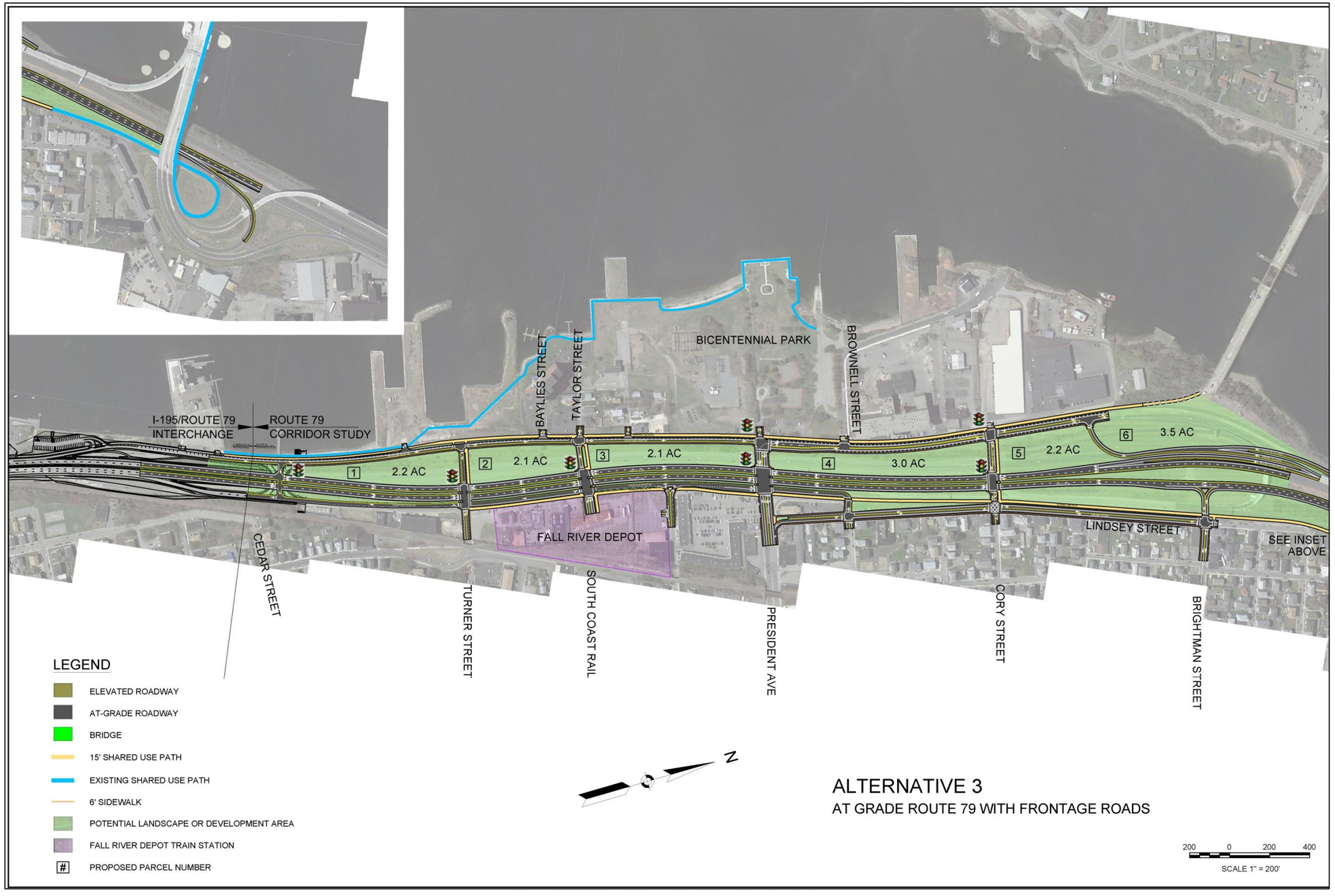


Figure ES-5: Final Alternative 3 Used for Analysis

Figure ES-6: Alternative 2 – Modified

- President Avenue at North Main Street: modify lane configuration and traffic signal phasing to introduce protected left turns. Upgrade accessible ramps and traffic signals to ADA standards.
- Lindsey Street at Brownell Street: install pavement markings and signage to emphasize crosswalks. Upgrade accessible ramps to ADA standards.
- Davol Street Bicycle Accommodations: modify pavement markings and install signs to provide bicycle lanes.

Medium-Term Improvements

- Shared-Use path on Davol Street West: reconstruct Davol Street West to reallocate space within existing right-of-way and provide a 10-foot shared-use path, 5-foot grass strip, 8-foot parking lane, and a 14-foot travel lane.

Alternatives Analysis

Four long-term alternatives were developed and refined based on preliminary planning, engineering, and Working Group input. Alternatives 1, 2, 2 – Modified, and 3 were analyzed in detail using forecasts developed by the CTPS travel demand model and evaluated using the established criteria. Alternatives 2 and 2 – Modified were based on the same forecasting scenario.

As summarized in Table ES-2, all four alternatives would meet the study goals and objectives to varying degrees and constitute an improvement over the No-Build. In addition to President Avenue, all alternatives would introduce three (four in case of Alternative 3) new east-west connections between the Fall River neighborhoods and the Taunton River waterfront, enabling safe access for vehicles, bicyclists, and pedestrians. This access would be limited to President Avenue under the No-Build conditions.

All four alternatives would equally provide direct access to and from the South Coast Rail Fall River Depot Station via the Taylor Street/Fall River Depot Driveway. Under the No-Build scenario, such access would be circuitous via Davol Street East, requiring vehicles approaching the station from the north to use the U-turn near Cedar Street and vehicles leaving the station and heading south to actually travel north towards President Avenue where they could reverse the direction. Pedestrian connection between the station and the waterfront would be limited to the President Avenue route.

While the No-Build scenario would maintain efficient regional and local operation in terms of vehicular level of service, it would lack connectivity afforded by the four Build alternatives. Alternative 1 would offer the most balance between regional and local traffic operation by maintaining high levels of service for through traffic on limited access Route 79 while adding east-west connections. Of all the alternatives it would also provide the shortest walking times between the neighborhoods and the waterfront since pedestrians would proceed under Route 79 without stopping.

Alternatives 2, 2 - Modified and 3 would introduce traffic signals along Route 79, increasing delay to through traffic. Under Alternative 2 all intersections within the Focus Area would operate at LOS C or

better. Alternative 2 – Modified would experience longer delays due to reduced Route 79 cross section with all intersections within the Focus Area operating at LOS D or better, although individual approaches may experience long queues and LOS E or LOS F during peak hours. Under Alternative 3 most of the intersections within the Focus Area would operate at LOS D or better with the exception of Route 79 intersection with President Avenue, which would operate at LOS E during the afternoon peak hour. While traffic signals would somewhat impede the through traffic, slower speeds and improved accessibility would be consistent with the redefined character of the corridor.

Pedestrian travel times would be greatly reduced under the four Build alternatives. For example, under the No-Build scenario an average person walking from Turner Street to City Pier along designated areas would have to travel circuitously via President Avenue for a distance of 3400 feet taking approximately 17 minutes. All of the Build alternatives would reduce this distance to less than 600 feet resulting in travel time saving of 12-13 minutes. Alternative 1 would offer the shortest travel times, followed by Alternative 2 – Modified, then Alternative 2, and finally Alternative 3. Bicycle accommodations would be very similar among all four Build alternatives, as well as opportunities to optimize bus transit service by connecting it to the Fall River Depot Station.

Table ES-2: Evaluation of Alternatives versus Study Objectives

Study Objective	Future No-Build	Alternative 1	Alternative 2	Alternative 2 Modified	Alternative 3
Provide better connectivity between Fall River and the waterfront	■	●	●	●	●
Enhance access to South Coast Rail	▬	●	●	●	●
Balance local and regional mobility	□	●	○	○	○
Improve and enhance safety conditions	□	●	●	●	●
Increase opportunities for economic development and land use	◇	◒	●	●	○
Minimize potential impacts to the environment and community	□	○	●	●	●

LEGEND:	Some	Moderate	Substantial
Benefits	○	◒	●
Impacts	□	▬	■
Neutral	◇		

While the No-Build scenario would not improve safety conditions within the Focus Area, all four alternatives, in addition to short-term improvements, would enhance vehicular, bicycle and pedestrian safety by reconfiguring high crash locations and providing dedicated ADA accessible facilities for non-motorized modes.

The No-Build alternative would present limited opportunity for economic development within the Focus Area. Such development could only happen within the existing parcels and would be hindered by lack of local connectivity and provisions for multimodal access. While economic development could happen elsewhere in the city, it would do little for enhancing the Fall River waterfront. The Build alternatives would introduce new development parcels which would shift anticipated spending, income, residents and jobs to the waterfront.

The level of development would vary among the alternatives. It would depend on the amount of newly created land, compatibility with regional forecasts established for the City of Fall River, and capacity of supporting infrastructure. Based on these parameters, Alternative 1 could support approximately 1.3 million square feet of new development. Alternatives 2 could support a slightly lower level of 1.2 million square feet due to reduced capacity of Route 79. Since travel demand forecasting was not performed for Alternative 2 – Modified, the analysis assumed the same development level as Alternative 2. Alternative 3 could support a significantly lower level of development, in the range of 0.3 million square feet. The roadway configuration under this alternative presents a substantial limitation to the amount of traffic that could be adequately processed.

The economic impacts associated with these alternatives would be proportional to the extent of development they could support. Table ES-3 presents a rough estimate of jobs that could be generated within the Focus Area under each development scenario. Alternative 2 – Modified is not shown as its level of development is identical to Alternative 2.

Table ES-3: Jobs & Residents Shifted to the Focus Area due to Route 79 Alternatives

Alternative	Land Use			Total Jobs & Residents
	Retail (SF)	Office (SF)	Residential (Units)	
Alternative 1 – Elevated Route 79				
Development	266,500	266,500	724	
Total New Jobs or Residents	666	1,066	1,448	3,180
Alternative 2 – At Grade Route 79				
Development	238,500	238,500	649	
Total New Jobs or Residents	596	954	1,298	2,848
Alternative 3 – At Grade Route 79 with Frontage Roads				
Development	51,000	51,000	137	
Total New Jobs or Residents	128	204	274	606

By creating significant amounts of open land within the proposed parcels, all alternatives would promote the use of sustainable design and incorporation of Best Management Practices (BMPs). The community would benefit greatly from the prospect of introducing extensive landscaping and aesthetic treatments, such as lighting and street amenities. Alternatives 2, 2 – Modified and 3 would provide the greatest benefit as lowering Route 79 would maximize these opportunities. Alternative 1, while still exhibiting a substantial improvement over the No-Build, would accomplish this to a lesser extent by retaining the visual barrier of elevated Route 79.

A preliminary costs estimate was compiled for each of the alternatives. The estimate includes the construction cost, the cost of environmental permitting and engineering, and right-of-way reclamation costs. Right-of-way reclamation constitutes the requirement to compensate FHWA for the value of land within the state highway layout originally funded by the federal government that is repurposed or sold for non-transportation purposes. These estimated values do not reflect fair market value analysis. They are based on a synthesis of existing assessed values, recent waterfront sales comparisons and local and regional benchmark commercial properties. The costs are summarized in Table ES-4.

Table ES-4: Estimated Grand Total Costs per Alternative

Cost	Alternative 1	Alternative 2	Alternative 2 – Modified	Alternative 3
Construction Cost	$100 Million	$55 Million	$55 Million	$55 Million
Environmental Permitting and Design	$15 Million	$8 Million	$8 Million	$8 Million
Right-of-Way Reclamation*	$2.7 Million	$2.7 Million	$3.5 Million	$4.2 Million
Grand Total Cost	$117.7 Million	$65.7 Million	$66.5 Million	$67.2 Million

*Right-of-way reclamation costs do not reflect fair market value and are based on synthesis of existing assessed values, recent waterfront sales comparisons and local and regional benchmark commercial properties

Recommendations

The purpose of this study is to develop alternatives that will foster economic development along the Fall River waterfront while improving multimodal accessibility between the waterfront and the neighborhoods. The framework for accomplishing this purpose is identified through the study's goals and objectives. The assessment of alternatives developed throughout the study was conducted with respect to their ability to achieve these goals and objectives. While alternatives that best meet these goals and objectives were determined in this study through a combination of analytical methods and an extensive public participation process, the policy context will aid in the decision making going forward. This report concludes the planning process and sets the stage for advancing the study's recommendations into the project development phase.

Assessment of the alternatives with regard to their performance and measures of effectiveness coupled with early and continuous community input and guided by the FHWA and MassDOT policies led to a determination that Alternatives 2 and 2-Modified would be the most advantageous in addressing the study goals and objectives. As such, these alternatives are recommended for advancing to the next step. Figures ES-7 and ES-8 present three-dimensional renderings of Alternative 2.

Figure ES-7: Rendering of Alternative 2 – Aerial View (Looking North)

Figure ES-8: Rendering of Alternative 2 – Street View (Davol Street Looking Northeast)

In addition to the long-term alternatives, a number of short-term and medium-term improvements are recommended for implementation. Although they do not fulfill the overall study goals and objectives, they improve safety and multimodal accessibility and can be implemented within a shorter time frame than the long-term alternatives due to lesser permitting and design requirements and lower construction costs. The next steps for the recommended long-term, short-term and medium-term improvements are listed in Table ES-5.

The Route 79 / Davol Street Corridor study has also been conducted in the context of transportation policy and planning principles that are significantly different from those that were in place when Route 79 and Davol Streets East and West were built. The planning environment for infrastructure in Massachusetts and around the country has changed, in terms of evolving policy positions and in local and regional priorities. The recommendations for this study were not determined strictly by how much vehicular traffic can be moved, but were also developed in accordance with the following state and Federal policies and regulations:

- MassDOT's GreenDOT Policy and the GreenDOT Implementation Plan, which embraces the goals that will include the design of a multi-modal transportation system, promote healthy transportation and livable communities, and triple the share of travel demand by bicycling, transit, and walking.
- MassDOT's Complete Streets Policy, which requires balancing the use of the public right-of-way for all transportation modes, and requires that MassDOT projects provide safe and accessible options for all travel modes for all ages and abilities, and emphasizes a multi-modal philosophy.
- The Massachusetts Healthy Transportation Compact and MassDOT's Healthy Transportation Policy Directive, an agreement between MassDOT, Massachusetts Health and Human Services, the Secretary of Energy and Environmental Affairs, and the Massachusetts Department of Public Health, which requires that all MassDOT projects not only accommodate, but actively promote healthy transportation modes. This legislation is designed to facilitate transportation decisions that balance the needs of all users, expands mobility, improves public health and supports a cleaner environment.
- Federal regulations, which include Moving Ahead for Progress in the 21st Century (MAP-21) which is FHWA's national surface transportation plan, that, among many other things, seeks to increase the emphasis on non-auto users and encourages opportunities for alternative travel modes including transit, bicycle and pedestrian.

All of these policies reflect the fact that roadways are part of an infrastructure that must serve all users, while being an integral part of the surrounding neighborhoods. Providing access for all modes and travelers, considering vulnerable roadway users, enhancing transportation choices, fostering community connectivity and economic development, and ensuring the public health of adjoining residents are important considerations that are recognized through the policies and initiatives described above.

The recommended alternatives will implement these goals, themes, policies and regulations by:

- Allowing for increased green space
- More trees in the median, along each side of Route 79, along the east side of Davol Street West, and along each side of the east-west connecting roads
- Improved bicycle and pedestrian access
- Improved access to bus and rail facilities

Table ES-5: Summary of Recommended Alternatives and Major Milestones

Recommended Improvement	Major Milestones	Responsible Party	Implementation Cost
Long-Term			
Alternative 2 and Alternative 2 - Modified	• Prepare and submit PNF, PIF and TEC • Determine NEPA and MEPA review requirements • Coordinate with SRPEDD to include project in the region's TIP • Coordinate with FHWA regarding Route 79 being part of NHS • Coordinate with City of Fall River regarding study area master plan • Coordinate with South Coast Rail on access to Fall River Depot • Coordinate with SRTA regarding options of modifying bus routes • Complete environmental permitting and preliminary engineering • Determine project delivery method • Procure and complete final design and construction	MassDOT	$66,500,000
Short-Term			
Davol St. U-turn near Cedar St.	• Implement upon substantial completion of I-195/Route 79 Interchange	City of Fall River	$9,000
President Ave. at Davol St. East and Lindsey St.	• Perform engineering • Procure and complete construction	City of Fall River	$55,000
President Ave. at North Main St.	• Perform engineering • Procure and complete construction	City of Fall River	$89,000
Lindsey St. at Brownell St.	• Perform engineering • Procure and complete construction	City of Fall River	$22,000
Davol St. Bicycle Accommodations	• Implement upon substantial completion of I-195/Route 79 Interchange	City of Fall River	$22,000
Medium-Term			
Davol St. Shared-Use Path	• Initiate project development: prepare and submit PNF and PIF • Coordinate with SRPEDD to include project in the region's TIP • Obtain survey • Complete environmental permitting and engineering • Procure and complete construction	City of Fall River	$1,320,000

Route 79 / Davol Street Corridor Study

Chapter 1

Study Area

Goals and Objectives

Evaluation Criteria

Public Involvement Plan

1.1 Introduction

The Route 79 / Davol Street Corridor Study is an effort by the Massachusetts Department of Transportation (MassDOT) to undertake a comprehensive review of the transportation network in the Route 79 / Davol Street corridor, which runs along the eastern bank of the Taunton River in Fall River, Massachusetts. The main purpose of the study is two-fold: to identify transportation improvements within the corridor that will facilitate economic development of the City of Fall River's waterfront and to increase or balance overall mobility and access for all users of the study area transportation corridor – motor vehicle drivers, public transit riders, pedestrians, and bicyclists. As a product of this study, the recommendations focus on transportation solutions that can provide mobility and access in all modes and improve the livability and economic opportunities within the study area neighborhoods, with the recognition that not all traffic congestion issues can be eliminated entirely.

The study encompasses five tasks:

- Task 1 – Study Area, Goals & Objectives, Evaluation Criteria, & Public Involvement
- Task 2 – Existing Conditions and Issues Identification
- Task 3 – Alternatives Development
- Task 4 – Alternatives Analysis
- Task 5 – Recommendations

Each study task culminates in a separate report chapter. Chapter 1 summarizes the results of Task 1, which is the study's framework: it defines the project study area, identifies study goals and objectives, lists evaluation criteria to be used in assessing and ranking alternatives, and outlines the public outreach elements.

1.2 Study Purpose and Need

The purpose of this study is to develop alternatives that will create land for economic development along the Fall River waterfront while improving multimodal connectivity and accessibility between the waterfront and the neighborhoods. This action is necessary for two primary reasons:

- The City of Fall River is experiencing high unemployment rates and has identified waterfront development to serve as a catalyst for boosting local and regional economy.
- Route 79 creates a physical barrier between the city neighborhoods and its waterfront, limiting access and adversely affecting the residents' quality of life.

1.3 Study Background

Over the past several years, the City of Fall River Redevelopment Authority (FRRA) and the Fall River Office of Economic Development (FROED) have completed a number of studies addressing the City's vision of revitalizing its waterfront. The most recent studies include the 2002 Fall River Harbor and Downtown Economic Development Plan prepared for FROED and the 2008 Route 79/Davol Street Transportation Study prepared for FRRA.

The purpose of the Fall River Harbor and Downtown Economic Development Plan was "…to increase the economic diversity of the community through the expanded use and revitalization of the harbor, the harbor front, and nearby areas within the downtown."[1] The Plan described the intention of the economic development strategy to reposition Fall River in the regional economy as an attractive destination. The Plan's recommendations linked public investments with the ultimate goal of increasing private sector investment and employment within the community. It recommended infrastructure improvements to support future redevelopment. Foremost among the Plan's recommendations was the conversion of Route 79 to an at-grade urban boulevard to support redevelopment of the City's waterfront sites.

The Route 79/Davol Street Transportation Study focused on developing conceptual alternatives with the following goals:

- To enhance multimodal access and transportation connections between City Pier and downtown Fall River
- To enhance the development potential of the waterfront area by creating developable land and improving transportation connections for vehicles, transit, pedestrians, and bicyclists.[2]

The study examined a number of alternatives and recommended a more detailed analysis of two alternatives: Alternative B – Four or Six Lane Boulevard; and Revised Alternative E – Relocated Route 79. Alternative B encompassed demolition of Route 79 and replacing it with a new boulevard with signalized intersections and a landscaped median. Revised Alternative E kept Route 79 as a limited access highway, but relocated it on a new alignment. Under both alternatives Route 79 was shifted to the east to open up land for potential development.

This current MassDOT Route 79 / Davol Street Corridor Study builds on the 2008 FRRA study, evaluates additional alternatives in greater detail, and broadens its objectives consistent with the Purpose and Needs statement.

1.4 Study Area

A critical component of the study framework is the study area. The study area for the Route 79 / Davol Street Corridor Study consists of two levels: (1) the Focus Area, which comprises the area in which potential transportation improvements are to be considered, and (2) the larger Regional Transportation Impact Area, which includes major intersections and roadways that affect the Focus Area and that may be impacted by any of the developed alternatives.

The Focus Area includes the Route 79 and Davol Street corridors along the Taunton River. The limits of the Focus Area were initially set at Brightman Street to the north and Cedar Street to the south. Based

[1] F*all River Harbor and Downtown Economic Development Plan, Final Plan,* The Cecil Group, Inc, prepared for the Fall River Office of Economic Development (October 2002)

[2]*Route 79/Davol Street Transportation Study, VHB/*Vanasse Hangen Brustlin, Inc, prepared for the Fall River Redevelopment Authority (June 2008)

on input from the Working Group, however, the Focus Area was extended north of Brightman Street up to but not including the interchange with the Veterans Memorial Bridge, so that the study could address connectivity between the shared use path currently crossing the Taunton River on the Veterans Memorial Bridge and the Route 79 corridor. The Focus Area, i.e. the area in which the study team is evaluating motor vehicle, pedestrian and bicycle operations under a range of roadway configurations and development scenarios, is illustrated in Figure 1.1.

Roadway elements included in the Focus Area are:

R-1 Route 79 between Cedar Street and Veterans Memorial Bridge
R-2 Davol Street East (northbound) between Cedar Street and Veterans Memorial Bridge
R-3 Davol Street West (southbound) between Cedar Street and Veterans Memorial Bridge
I-1 Intersection of Davol Street East (northbound) with Turner Street
I-2 Intersection of Davol Street East (northbound) with Pearce Street
I-3 Intersection of Davol Street East (northbound) with President Avenue
I-4 Intersection of Davol Street West (southbound) with Baylies Street
I-5 Intersection of Davol Street West (southbound) with President Avenue
I-6 Intersection of Davol Street West (southbound) with Brownell Street
I-7 Intersection of President Avenue and Lindsey Street
I-8 Intersection of President Avenue and North Main Street
I-9 Intersection of Brownell Street with Lindsey Street

The purpose of establishing the Regional Transportation Impact Area is to enable the study team to:

- Better understand the role and function of the transportation infrastructure in the Focus Area as it relates to the regional transportation network, and
- Evaluate the indirect impacts of study alternatives beyond the Focus Area.

This broader regional element of the analysis is quantified primarily in terms of level of service at major roadways, interchanges and intersections, as well as system-wide performance indicators, such as vehicle-miles traveled and vehicle-hours traveled. At first, the Regional Transportation Impact Area was proposed to comprise a triangle formed by three major highways: Route 24 on the east, Route 79 on the west and I-195 on the south. Route 79 and Route 24 are the two major north-south highways that generally define the east and west limits of Fall River and to some extent complement each other. Although each highway serves its distinct purpose - Route 79 is the primary connection between the Veterans Memorial Bridge and the Braga Bridge/I-195 with the only other roadway connection across the Taunton River approximately 8 miles to the north, while Route 24 is a major link to Rhode Island - they both connect to I-195 and provide access to various city neighborhoods. As such, modifications to one of these routes may affect the other. I-195 connects the two highways, thus the three roadways were selected as logical boundaries of the regional impact area.

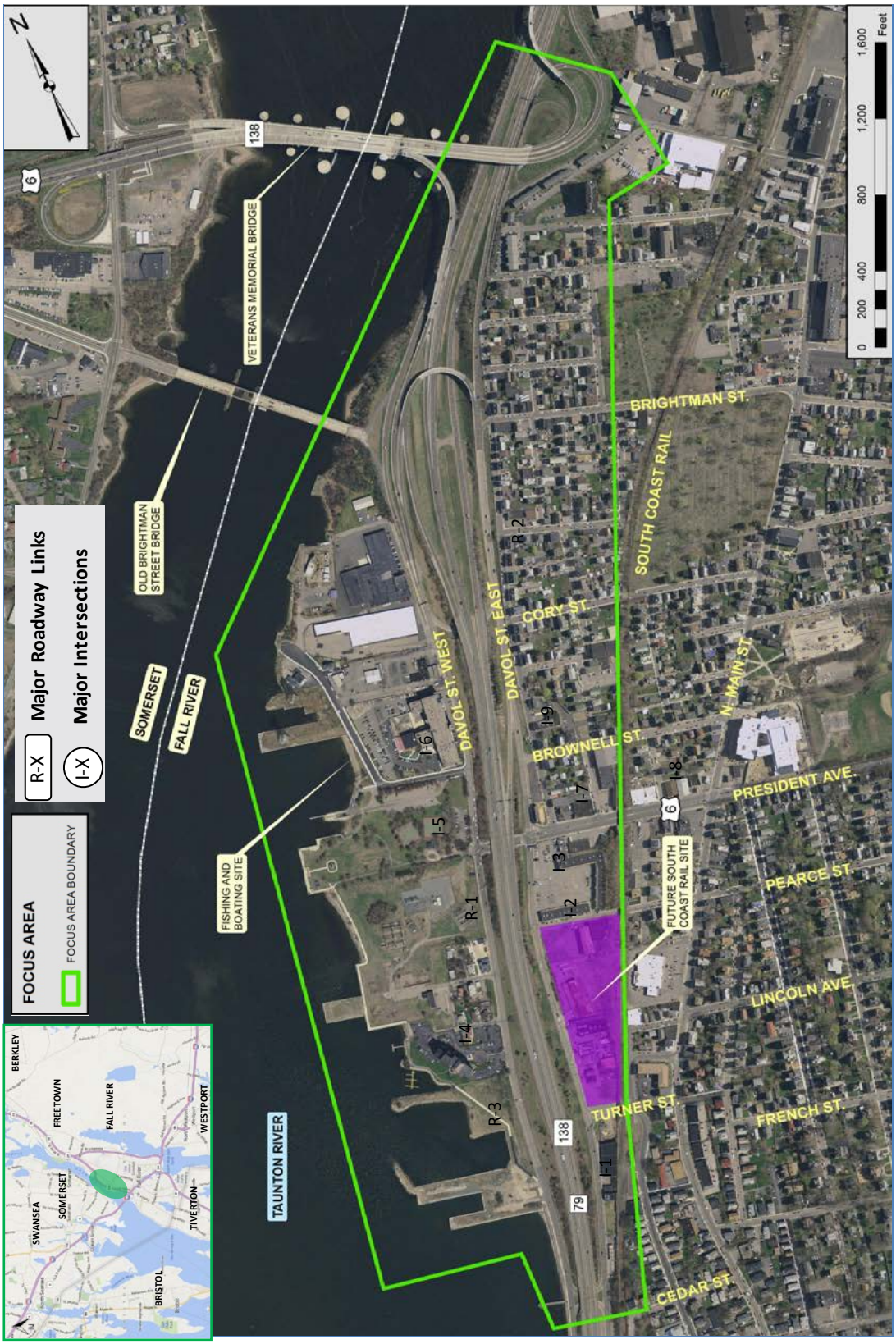


Figure 1.1: Focus Area

Upon receiving input from the Working Group, however, the study area was expanded into Somerset to include U.S. Route 6 and I-195, roadways that could be affected by potential traffic diversions under various alternatives between the two bridges that cross the Taunton River. The Regional Transportation Impact Area illustrated in Figure 1.2 includes the following roadway facilities:

Fall River:

- Route 24 between Route 79 and I-195
- Route 79 between Rout 24 and I-195
- I-195 between Route 24 and Plymouth Avenue
- President Avenue (U.S. Route 6) between Route 24 and Davol Street
- Interchange of Route 24 with Route 79 (Route 24 Exit 7)
- Interchange of Route 79 with North Main Street
- Interchange of Route 79 with Veterans Memorial Bridge
- Interchange of Route 24 with President Avenue / Eastern Avenue (Route 24 Exit 5)
- Easterly Interchange of Route 24 with I-195 (Route 24 Exit 4)
- Westerly Interchange of Route 24 with I-195 (I-195 Exit 8)
- Interchange of I-195 with Plymouth Avenue (I-195 Exits 6-7)
- President Avenue (U.S. Route 6) / Eastern Avenue Rotary
- Intersection of President Avenue (U.S. Route 6) with Elsbree Street
- Intersection of President Avenue (U.S. Route 6) with Robeson Street
- Intersection of President Avenue (U.S. Route 6) with Highland Avenue

Somerset:

- U.S. Route 6 between Veterans Memorial Bridge and Lees River Avenue
- Interchange of I-195 with Wilbur Avenue/Lees River Avenue (I-195 Exit 4)
- Intersection of U.S. Route 6 Eastbound off-ramp with Riverside Avenue
- Intersection of U.S. Route 6 with Brayton Avenue
- Intersection of U.S. Route 6 with Brayton Point Road
- Intersection of U.S. Route 6 with Lees River Avenue
- Intersection of Brayton Point Road with Wilbur Avenue
- Intersection of Brayton Avenue with Read Street
- Intersection of U.S. Route 6 with Gardners Neck Road (Swansea)

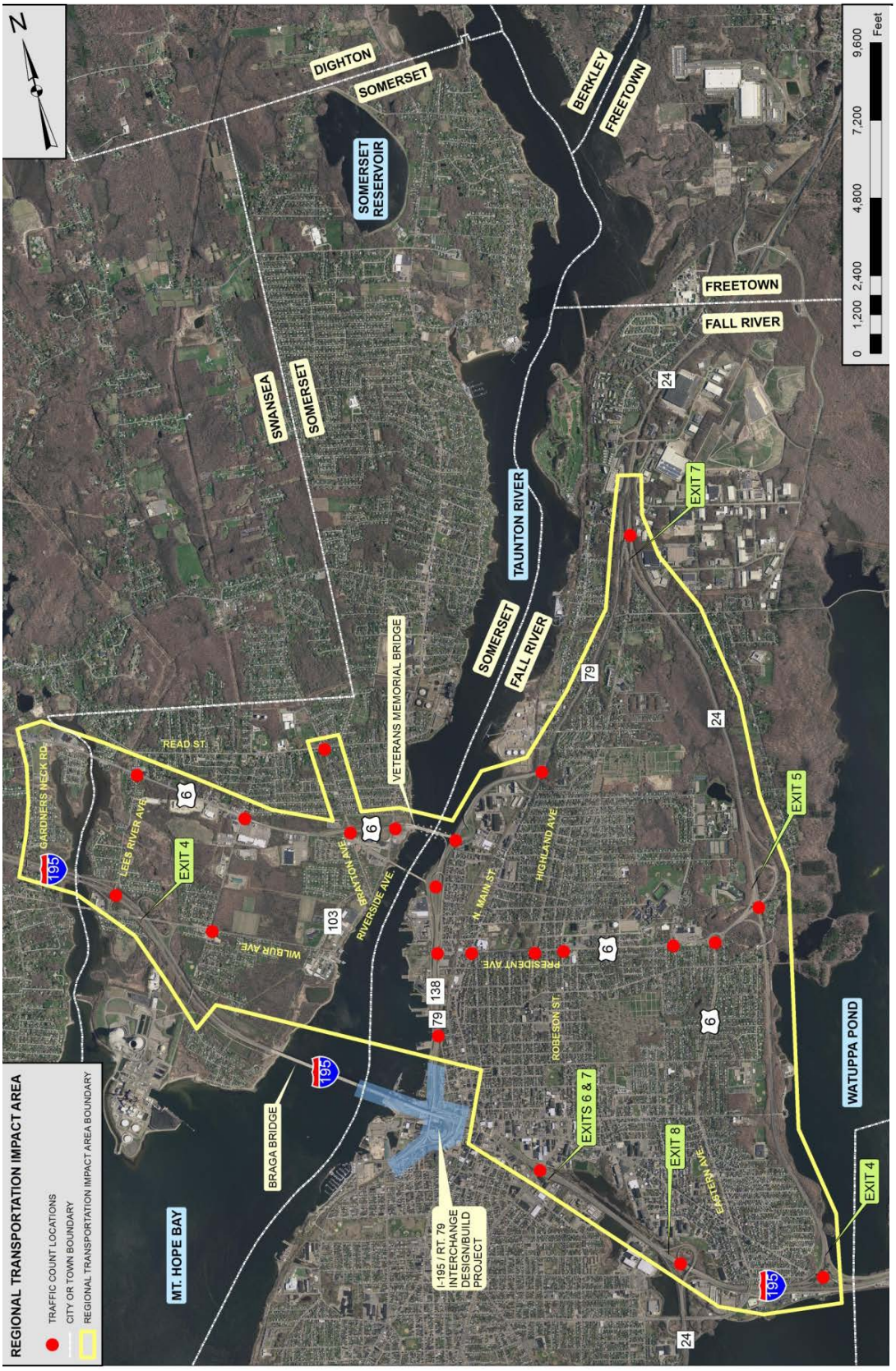


Figure 1.2: Regional Transportation Impact Area

Specifically excluded from the study area is the interchange of I-195 with Route 79. This interchange is being reconstructed as part of the MassDOT Accelerated Bridge Program under a separate Design-Build contract with a substantial completion date of 2016. To avoid duplication of effort, the Federal Highway Administration required that the I-195/Route 79 Interchange Project not be combined or overlap with any projects that may evolve from this study. This study incorporates the planned improvements at this interchange into the future conditions evaluation. A detailed overview of this project can be found in the June 2011 Interchange Modifications Report[3] and the May 2012 Functional Design Report[4].

1.5 Goals and Objectives

Goals and objectives for the study were developed by MassDOT jointly with the study Working Group. The goals are meant to define the desired outcomes of the study in a concise manner. The objectives describe how these goals will be accomplished. Together, the goals and objectives shape the overall study framework, which guides the development and assessment of potential transportation improvements.

The Goals and Objectives for the study area are listed below:

Goal: Improve mobility, connectivity, and safety for all transportation modes and users along and across the Route 79 and Davol Street corridor study area.

Objectives:

- Provide new connections between Fall River neighborhoods and its waterfront
- Provide ADA-compliant pedestrian facilities throughout the project limits, including access to the future South Coast Rail
- Introduce bicycle accommodations throughout the project, including connection to the Veterans Memorial Bridge shared use path and access to the future South Coast Rail
- Maintain acceptable levels of service at both regional and local levels
- Implement measures to improve safety at high crash locations

Goal: Promote and foster local and regional economic development potential.

Objectives:

- Create new development parcels
- Provide multimodal access to development parcels
- Facilitate economic vitality and attractiveness of parcels through efficient access
- Develop roadway infrastructure that will support the desired development size and mix

[3] *Route 79/I-195 Interchange Modification Report (IMR) Fall River, Massachusetts*, Jacobs, prepared for MassDOT (June 2011)
[4] *Route 79/I-195 Interchange Reconstruction Project 25% Design – Functional Design Report Fall River, Massachusetts,* Jacobs, prepared for MassDOT (October 2011, Updated May 2012)

Goal: Improve the quality of life for residents of surrounding neighborhoods and throughout Fall River.

Objectives:

- Provide new neighborhood connections to the waterfront
- Integrate multimodal circulation with reconfigured roadways and new development parcels
- Provide opportunities for enhancing attractiveness of the waterfront by improving aesthetics within the corridor
- Provide fair and equitable treatment for Environmental Justice population
- Minimize air quality impacts
- Provide multimodal access to the future South Coast Rail station

1.6 Evaluation Criteria

The evaluation criteria are specific considerations, or measures of effectiveness, used to assess benefits and impacts of alternatives developed during the study. The evaluation criteria are based on the defined goals and objectives. As shown in Table 1.1, six general evaluation categories were established and confirmed by the study Working Group to be consistent with the study goals and objectives:

Table 1.1: Evaluation Criteria Categories and Corresponding Goals

Evaluation Criteria Category	Corresponding Project Goal
Mobility	Improve mobility, connectivity, and safety for all transportation modes and users along and across the Route 79 and Davol Street Corridor Study area
Safety	
Land Use and Economic Development	Promote and foster local and regional economic development potential
Health and Environmental Effects	Improve the quality of life for residents of surrounding neighborhoods and throughout Fall River
Community Effects	
Cost	A key factor supporting all project goals

These evaluation criteria, which are based on either quantifiable or more subjective qualitative measures of effectiveness, have been used to determine the best solutions for the defined goals and objectives. The detailed list of evaluation criteria and corresponding measures of effectiveness is presented below in Table 1.2.

Table 1.2: Evaluation Criteria

Evaluation Criteria	Measures of Effectiveness
Mobility	
Roadway Operational Functionality	Intersection delay and level of service
	Volume to capacity ratio
	Calculated 50th and 95th percentile queues
	Merge, diverge, and weave level of service
	Highway and ramp level of service
Travel Time	Average travel time through the Route 79 corridor
	Area wide travel time reliability
	Overall network delay
	Average travel times within regional transportation impact area (Route 79, Route 24, U.S. Route 6)
Efficiency	Vehicle-miles traveled
	Vehicle-hours traveled
Safety	
Pedestrian and Bicycle Safety	ADA Compliance
	Number of conflicts with vehicles
	Provision of designated facilities
Vehicular Safety	Conformance to AASHTO and MassDOT standards
	Maintenance of traffic during construction
	Emergency Vehicle Access
Health and Environmental Effects	
Sustainable Design	Impacts on environmental resources
	Inclusion of Low Impact Design (LID) standards
	Net change in impervious surface area
Air Quality	Total emissions
Land Use and Economic Development	
Economic Development Potential	Area of created developable land
	Accessibility of potential development parcels
	Number of east-west connections between Fall River and waterfront
Socio-Economic and Fiscal Impacts	Number of new jobs
	Number of new housing units
	Generated disposable income
	New tax generation

Table 1.2: Evaluation Criteria (Continued)

Evaluation Criteria	Measures of Effectiveness
Community Effects	
Pedestrian and Bicycle Operational Functionality	Number of pedestrian crossings/access points to waterfront
	Linear feet of sidewalk
	Pedestrian delay
	Linear feet of designated bicycle facilities (path, bike lane, sharrow)
	Improved access to South Coast Rail
Vehicular Accommodations	Redistribution of peak hour and daily traffic
	Number of east-west connections between Fall River neighborhoods and the waterfront
Visual Impacts	Landscaping opportunities
	Water views
Compatibility	Compatibility with local and regional transportation plans, strategic plans and plans of conservation and development
Construction Impacts	Construction duration
	Lane closures and detours
	Maintenance of access to abutters
	Disruption to local businesses
	Right-of-way impacts
Cost	
Construction Cost	Order of magnitude implementation cost
	Right-of-way impacts

1.7 Public Involvement Plan

A public involvement plan developed to support civic engagement in the study emphasizes the following principles, followed by a description of how the study was conducted in accordance with these principles:

- *The public shall have access to information about the study:* A record of all the study's public information and Working Group meetings were kept. The record included meetings presentations, handouts and a summary of public discussion. Technical study documents and meeting handouts were posted on the project website. A copy of the draft and final report will be available at the Fall River Public Library.
- *The public shall be presented with clear information:* Information will be clearly written using clear, understandable language, and technical terms and regulatory procedures will be explained.

- *The public shall learn about or become engaged in the study in a variety of ways:* Methods to inform and engage the public included public informational meetings, Working Group meetings, study website, local newspapers articles, and project newsletters.
- *The public shall be able to engage with a responsive study team:* Two public meetings and eight Working Group meetings were held. At each meeting public comments were received and responded to either immediately or the comments were considered by the team and were used to inform the design of alternatives. Ample time to review any materials was also provided. All public questions and inquiries were answered in a timely manner.
- *The public shall be able to participate in a process that is well coordinated:* The public and Working Group received sufficient notice of meetings, which were scheduled at a time and place in the community that was convenient and comfortable. Ample time to review materials was provided. All public questions and inquiries were answered in a timely manner.
- *All public outreach shall be conducted in a manner that is inclusive and sensitive*, especially to the needs of Environmental Justice populations. At the outset of the study the team collaborated with the Southeastern Planning and Economic Development District to identify Environmental Justice population. Translation services for Portuguese- and Spanish-speaking persons were provided at public meetings. Newsletters and press releases to local media outlets and public meeting flyers were provided in English and Portuguese.

1.7.1 Elements of the Plan

Specific elements of the Public Involvement Plan include:

1.7.1.1 Study Working Group

A Working Group was created to guide the planning process for the Route 79 / Davol Street Corridor Study. Many of its members were formerly involved in the I-195 / Route 79 "spaghetti ramps" project. Stakeholders/interests represented on the Working Group include the project area neighborhood advocacy groups, bicycling advocates, regional planning and transit agencies, environmental/water resources groups, recreation and municipal entities, state and federal government (elected officials and staff). Working Group members assisted the study effort by providing advice and insight on local issues, identifying deficiencies in the network, and developing and assessing improvement alternatives.

The study team took a collaborative approach with the Working Group. The study team shared relevant study documents with the Working Group as they were developed. Agendas were sent to the group in advance of the meetings to allow adequate time for review before meetings. Working Group members were asked to bring concerns and insights for discussion to the study team. Alternatives were shared as they were developed, and impacts of those alternatives were examined as the study progressed. Alternatives were continuously refined based on feedback by the Working Group. Working Group members assisted the team in conducting community outreach

by identifying issues important to their interests and the public at large, identifying other key stakeholders, and attending public meetings to discuss the progress of and show support for the study.

Eight Working Group meetings were held. These meetings were coordinated with the five study tasks listed earlier and were focused around the following topics:

- *Working Group Meeting #1:*
  - Overview of the study process
  - Initial discussion of the Study Area, Goals and Objectives, and Evaluation Criteria
  - Presentation of the Public Involvement Plan
- *Working Group Meeting #2:*
  - Addressed comments received at Working Group Meeting #1 regarding the Regional Impact and Focus Study Areas and Goals and Objectives
  - Discussion of existing conditions, including traffic, multimodal, socio-economic and environmental considerations
  - Discussion of future No-Build conditions
- *Working Group Meeting #3:*
  - Continuation of discussion of future No-Build conditions
  - Identification of issues and constraints
  - Initial discussion of potential alternatives
- *Working Group Meeting #4:*
  - Review of short-term improvements
  - Review of long-term alternatives
- *Working Group Meeting #5:*
  - Addressed comments received at Working Group Meeting #4 regarding short-term improvements
  - Addressed comments received at Working Group Meeting #4 regarding long-term alternatives
- *Working Group Meeting #6:*
  - Overview of the shortlisted long-term alternatives
  - Discussion of alternatives analysis, including methodology for determining development size, transportation analysis, and evaluation criteria matrix
- *Working Group Meeting #7:*
  - Review of refinements to shortlisted long-term alternatives
  - Discussion of Environmental Justice analysis
  - Review of comments received at and after the second public meeting
- *Working Group Meeting #8:*
  - Present draft recommendations
  - Solicit input from the Working Group

1.7.1.2 Public Meetings

The study team conducted two public meetings during the course of the project development. The first meeting was held after the study area, goals, objectives, and evaluation criteria for the project were finalized, data collection completed, and constraints and issues were identified. The meeting was structured around presentation of these materials followed by a question and answer period.

The second public meeting was held after completion of Task 4 to present and solicit input on the short-term improvements and long-term alternatives. The format for the second public meetings was a "blended" open house/presentation. The meeting opened with an informal session where the public was able to review information displays and have an opportunity for one-on-one discussion with members of the study team and Massachusetts Department of Transportation officials. After the open house session, the study team made a formal presentation of the study's purpose and progress followed by a question and answer period.

1.7.1.3 Outreach to Environmental Justice Communities

Special efforts were made to engage and communicate with Environmental Justice populations in the Route 79/Davol Street Corridor Study area. At the initiation of the study, the project team used census data to evaluate the socio-economic profile, age, and language proficiency of residents in the corridor. Once the existence of Environmental Justice populations was verified, the study team utilized an Environmental Justice population contact list developed by the Southeastern Regional Planning and Economic Development District (SRPEDD) and identified 10 social service agencies and civic organizations that may have an interest in or connection to the Route 79/Davol Street Corridor. The following organizations were invited to participate: Bristol Community College, Bristol Elder Services, Community Connections, Fall River Housing Authority, Fall River Tenants Association, North End Neighborhood Association, SER Jobs for Progress, Inc., Southeast Center for Independent Living, Jobs for Progress, Inc., and United Interfaith Action. Three of the identified Environmental Justice groups - Bristol Community College, Fall River Tenants Association and North End Neighborhood Association joined the study's Working Group. In addition, other organizations on the SRPEDD Environmental Justice list were already identified for participation in the Working Group. They are: Boys and Girls Club of Fall River, Fall River Office of Economic Development, and Highlands Neighborhood Association.

Portuguese, English and Spanish language flyers were used to publicize the Public Information Meetings. Press releases announcing the meetings were created in Portuguese and distributed to the Portuguese community newspaper "O Jornal" as well as the Portuguese language radio station WHTB/1400 AM. A Portuguese language project newsletter was distributed at the public meetings and a translator was available at the meetings to interpret in Spanish and Portuguese.

1.7.1.4 Project Website

MassDOT developed and maintained an interactive website for the general public as a way to support the study's public participation efforts. The website provided updates on the progress of the study, advertised meetings, provided access to meeting reports and documents and allowed people to make comments and ask questions. The website adhered to all ADA and Section 508 Website Accessibility Standards. The website included:

- Project Overview
- Project Schedule
- Meetings / Meeting Summaries
- Project Documents
- Contact Information (including a comment submittal form)
- Resources/Links

The study website http://www.massdot.state.ma.us/route79 was updated on a regular basis throughout the study process.

1.7.1.5 Newsletters / Fact Sheets

The Study Team published and distributed periodic updates in a newsletter or fact sheet format. The newsletter / fact sheets were distributed electronically to the fullest extent possible to members of local boards and commissions, neighbors and abutters, local college communication networks, and the press.

Two printed newsletters were published and distributed [See Appendix]. The first newsletter was published after the development and analysis of alternatives. The second was published at the completion of the draft recommendations.

1.7.1.6 Media Coordination / Other Communication Networks

The Study Team reached out to the media in advance of public meetings to announce the upcoming meetings. The Working Group provided assistance in identifying the appropriate media outlets for such announcements. Between meetings, all press inquiries were coordinated through MassDOT's public affairs section.

Local news outlets that received information included:

- Newspaper
  - Herald News
  - Fall River Spirit (online publication)
  - O Jornal (Portuguese community newspaper)
- Radio
  - WSAR/1480 AM
  - WHTB/1400 AM (Portuguese language radio station)

- Television – Fall River
  - FRGTV (community access)
  - FRCTV (community access)
  - FREDTV (educational station)

In addition, the study team reached out to other communication networks within the City of Fall River, such as:

- Community e-mail distribution list maintained by the Mayor's office.
- www.unitedneighborsoffallriver.org
- Community organizations that serve populations with limited access to transportation options, e.g. Community Connections, Inc., Southeast Center for Independent Living, United Interfaith Action

Route 79 / Davol Street Corridor Study

Chapter 2

Existing Conditions

Future No-Build Conditions

Issues Evaluation

2.1 Existing Environmental Conditions

The following section documents an inventory of the existing land use and environmental conditions, which was used during the alternatives development and analysis tasks. More specifically, the product of this inventory was a list of issues and constraints used during the development and analysis of the improvements and alternatives to avoid significant impacts and determine the extent of impacts where they could not be avoided. Additionally, opportunities were also identified that would serve to benefit the overall goals and objectives of the study.

To assess existing environmental conditions for the study area, data from the MassGIS database were acquired and superimposed onto aerial photographs of the project study area. In addition to this mapping, information gleaned from reviewing a variety of natural resource web sites was also used to document existing conditions in the study area. As this was a planning study, conceptual level coordination with resource agencies was undertaken to ascertain the presence and/or absence of federally threatened and endangered species. Coordination with natural resource agencies, including the National Park Service (NPS), will become more important as any alternatives move forward into the environmental documentation phase that may be required by both the National Environmental Policy Act (NEPA) and Massachusetts Environmental Policy Act (MEPA).

Route 79 is located along the western side of the City of Fall River, an urban area. MassGIS land use and land cover GIS data depicted in Figure 2.1 shows that the land use directly east of the existing roadway is predominantly high-density residential with some commercial and industrial properties interspersed. The northeast quadrant between Route 79 and the rail line accommodates numerous single family homes along with some apartment buildings. The North Burial Ground, a cemetery listed on the National Register of Historic Places (NR), is located just east of the railroad tracks off of North Main Street.

Much of the central sections of the area east of Route 79 are dominated by commercial and industrial uses along both sides of the railroad. To the south and east, the dominant land use is densely populated residential and includes two historic districts, Highlands and Lower Highlands. The Highlands neighborhood is a triangular shaped area bounded by Highland Avenue, Elsbree Street and President Avenue. The Lower Highlands neighborhood is located east of Route 79, south of Prospect Street, north of I-195 and west of High Street. There is little open space other than the North Burial Ground. However, there are two town parks. North Park is located just east of North Main Street and north of President Avenue. Bicentennial Park is located west of Davol Street West at President Avenue.

The land to the west of Route 79 varies widely and includes commercial properties, apartments and condominiums, industrial sites including an electric utility substation, parkland and a boardwalk along the edge of the Taunton River.

The most prominent natural resource within the project study area is the Taunton River, which lies just to the west of Route 79. In 2009, the entire 40-mile stretch of the Taunton River from the Town of

Bridgewater, south to its confluence with Mt. Hope Bay, was officially designated as part of the National Wild and Scenic Rivers System, discussed further under the Existing Surface Water Resources section.

The studies that led to this designation recognized the Taunton River for its remarkable natural, historic and scenic attributes. Also noted was that a limited number of parcels along the river are under any type of protection by local, state or federal governments, suggesting that the Taunton River is extremely vulnerable to development. Since the Route 79 / Davol Street Corridor Study includes the promotion of economic development, any proposed impacts to the Taunton River would require an increased level of scrutiny. However, the Wild and Scenic Rivers Act also encourages residents and visitors to learn more about the attributes of the river, to enjoy its scenic beauty and encourages recreational uses both on and near the river. These uses can extend to walking and biking paths along the river's edge, and is a major focus of this study.

Within the project Study Area, the City of Fall River maintains a water main that runs east-west near Cory Street. This water main crosses underneath Davol Street East, Route 79, Davol Street West and the Taunton River. The City of Fall River also maintains combined sewers (storm water and sanitary sewer) along Davol Street West and President Avenue. Combined sewer outlets into the Taunton River are located near Bicentennial Park where a screening and disinfection facility was recently constructed and near City Pier where a sewer separator facility is planned for construction. No pump stations are present in the Focus Area between Davol Street West and Davol Street East. It is not anticipated that any existing water mains will act as constraints during the development of alternatives.

2.1.1 Existing Surface Water Resources

The Taunton River is the only surface water resource within the project study area, and is located just west of Route 79 and Davol Street West. Within the vicinity of the project Focus Area, the Taunton River has three bridge crossings: the Braga Bridge along I-195, the former Brightman Street Bridge that is now closed to traffic, and the Veterans Memorial Bridge which was completed in 2011 to replace the Brightman Street Bridge.

The Taunton River forms at the confluence of the Town River and the Matfield River in the Town of Bridgewater. From there it meanders in a southerly direction through the towns of Halifax, Middleborough and Raynham, through the City of Taunton for which it is named, the towns of Berkley, Dighton, Somerset, and the Assonet section of Freetown, to Fall River where it joins Mount Hope Bay, an arm of Narragansett Bay. The total length is approximately 40 miles from its beginning in Bridgewater to the mouth of the Quequechan River in Fall River.

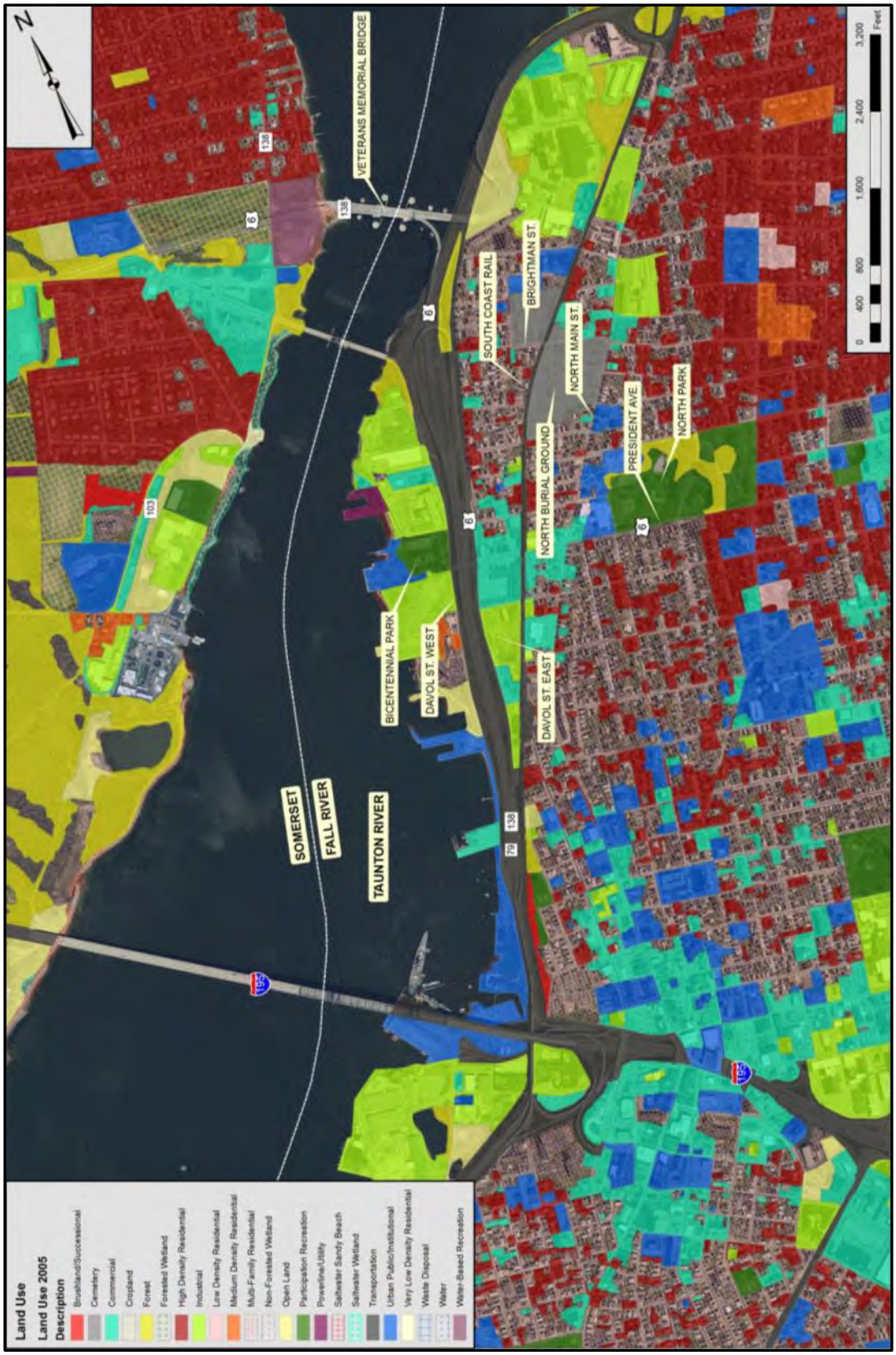


Figure 2.1: Land Use Classification

The Taunton River watershed encompasses approximately 562 square miles and includes the Hockomock Swamp, the largest freshwater wetland in the state. The Taunton River, designated as a Wild and Scenic River, is one of the flattest rivers in New England, dropping only about twenty feet in elevation over its length. The river is tidal as far north as Taunton and is the longest undammed coastal river in New England.

The federal Wild and Scenic Rivers Act protects the river's values, character and existing uses while preventing any federally licensed or assisted projects that would negatively impact the river's values or character. River values include hydrology, fish, ecological and biological diversity, scenery, recreation, history and archaeology. The US NPS is required to review all federal decisions associated with the river to ensure protection of the river and supports the Taunton River Stewardship Council to ensure implementation of the Taunton River Stewardship Plan. Like most major rivers, the Taunton River is a vital natural resource that sustains a wide variety of plants, fish, and wildlife, while offering scenic beauty to the landscape and offering a wide range of recreational opportunities to tourists and the local population.

2.1.2 Existing Floodplains

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps and GIS data obtained from MassGIS were reviewed to identify floodways and 100-year and 500-year floodplains within the project study area. The only floodplain resources located within the study area are associated with the Taunton River and are depicted in Figure 2.2. A floodway is an area located within the floodplain that must remain undeveloped in order to allow the base flood, or 100-year flood, to discharge. The water within the floodway is typically the deepest and fastest, and as such, the land within the floodway is at the greatest risk during flooding events. The Taunton River does not have a designated floodway.

Flood Insurance Studies (FIS) are conducted under standards set by FEMA in order to determine areas at risk during 100-year and 500-year storms. The FIS completed in the vicinity of the Focus Area developed flood profiles for the Taunton River while modeling 100-year and 500-year storms in order to determine base flood elevations for these events at different locations along the river. These floodplains and elevations are presented on Flood Insurance Rate Maps, and are broken down into different zones based on the different hazards faced within that area. Zone A areas are located within the 100-year floodplain. Zone B includes areas within the 500-year floodplain and beyond the 100-year floodplain. If an area is subject to inundation during the 100-year flood and also faces dangers due to storm-induced velocity wave action, this area is included within Zone V. If base flood elevations are known, as is the case for the Taunton River, Zones A and V are renamed to Zone AE and Zone VE.

The 100-year floodplain associated with the Taunton River covers much of the land west of Route 79 and Davol Street West but also extends further to the east as far as the railroad tracks at the southern limits of the Focus Area. The 500-year floodplain extends further inland than the 100-year floodplain in a few isolated areas and encroaches onto Route 79 near

President Avenue. Figure 2.2 shows Flood Zone AE (100-year floodplain) in yellow, Flood Zone VE (100-year floodplain with risks due to storm-induced velocity wave action) in green, and Flood Zone B (500-year floodplain) in red.

2.1.3 Existing Groundwater Resources

Aquifer and groundwater information was obtained from the United States Geological Survey (USGS) Hydrologic Atlas produced by the USGS Water Resource Discipline (WRD) via MassGIS (1960s to the present). Groundwater resources in the Commonwealth of Massachusetts are not assigned a water quality classification but instead are designated as either "high" or "medium" output water supply aquifers.

The principal aquifers of the Taunton River basin are sand and gravel deposits within stratified drift. Stratified-drift deposits are exposed at land surface over about 62 percent of the basin. They are primarily ice-contact (kame), outwash, and lake-bottom sediments, which were deposited in preglacial bedrock valleys and in water-filled depressions in the till surface during retreat of the last glacier. Stratified drift is more abundant in the central and southern parts of the basin than in the northern part. In the northern one-third of the basin, stratified drift fills narrow, north-south trending valleys, which are bounded by till-bedrock uplands. The surficial geology of the project area is shown in Figure 2.3.

2.1.4 Existing Aquifers and Public Water Supplies

Drinking water for the City of Fall River is obtained from the North Watuppa Pond. When needed, supplementary water is pumped from Copicut Reservoir into the watershed of the North Watuppa, from which it flows into the North Watuppa Pond via King Phillip and Blossom Brooks. Fall River also has additional water resources not currently used for drinking water. These include the South Watuppa Pond, Terry Brook Reservoir, Sawdy and Devol Ponds, and Lake Noquochoke.

About 10,000,000 gallons of water are delivered per day to the City. This includes water supplied to residential, commercial, municipal, and industrial customers; and for fire protection. In addition, about 600,000 gallons per day is sold to the neighboring communities of Tiverton, Westport and Freetown.

The maximum capacity of the water treatment facility at the North Watuppa Pond is 24,000,000 gallons per day of finished water. The processes carried out there include disinfection by chlorination, removal of solids contaminants by flocculation and sedimentation, and filtration through sand and carbon for "polishing" and taste and odor removal. The water distribution system contains seven storage tanks, and over 250 miles of distribution pipeline.

Residents and businesses within the study area receive public drinking water from this distribution system, which is maintained by the Fall River Water Department. An existing water

main crosses under Route 79 and Davol Streets West and East near Cory Street. The exact locations of the drinking water distribution system within the project study area will need to be determined by project engineers during project design development and through coordination with the City of Fall River Water Department.

2.1.5 Existing Wetlands

The MassGIS database entitled DEP Wetlands (1:12,000) was used to identify wetland resources within the project study area. Figure 2.2 depicts the wetland resource areas within the study area limits. The primary wetland resource area is the Taunton River. The only other proximate wetland resource area is the Quequechan River, which is located south of the Focus Area limits. There are no emergent, scrub-shrub or forested wetland areas within the study area.

If this conceptual planning study were to recommend a long-term build alternative, which would then transition into any formal environmental documentation phase required by both the National Environmental Policy Act (NEPA) and Massachusetts Environmental Policy Act (MEPA), a more detailed assessment of wetland functions and values, vegetative species composition, and overall quality would need to be undertaken.

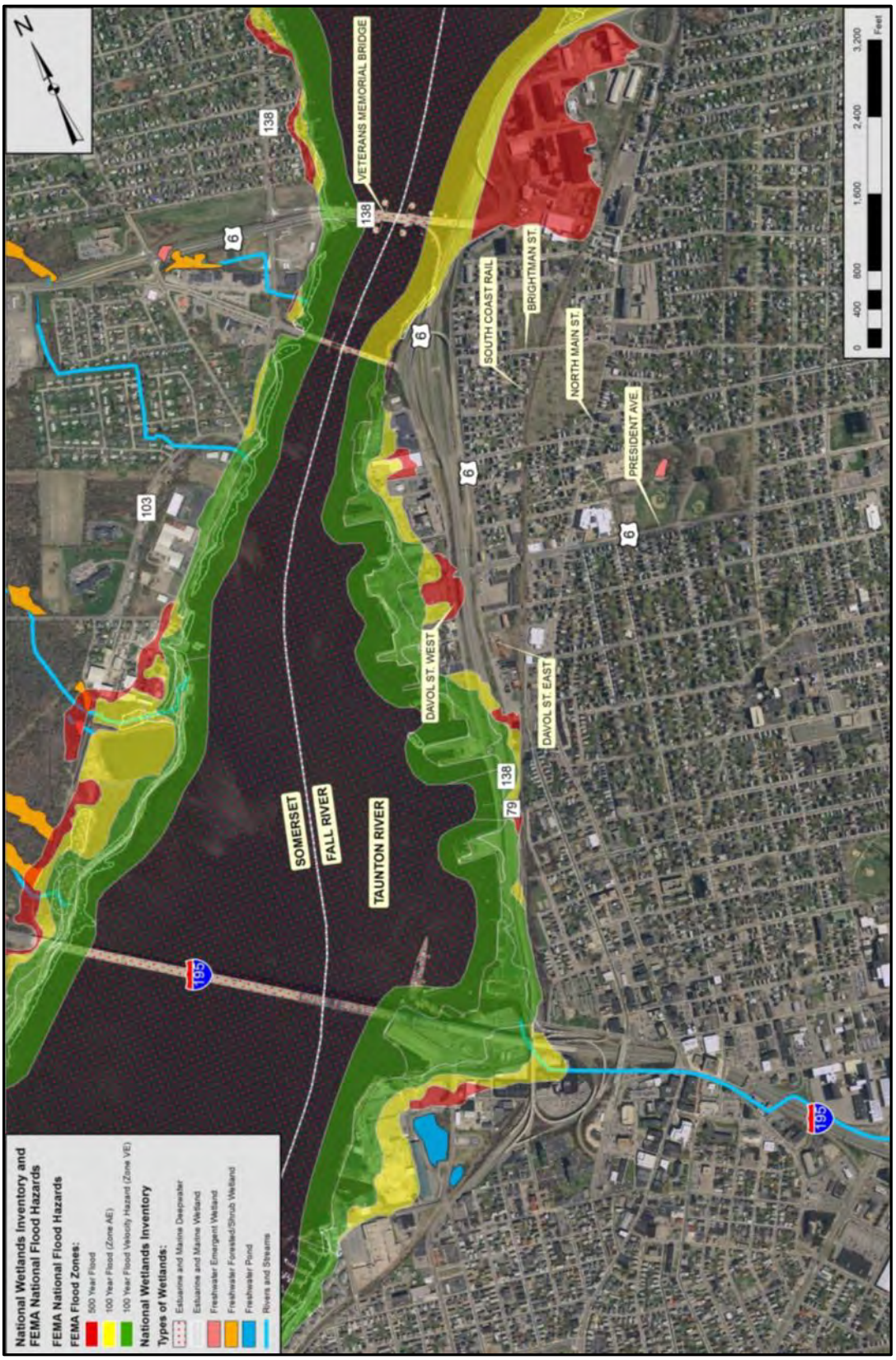


Figure 2.2: 100-Year and 500-Year Floodplains and Wetland Resource Areas

Figure 2.3: Surficial Geology

2.1.6 Existing Fish and Wildlife Habitat

The Taunton River varies from the clear headwaters to the sluggish, fertile stretches, lush with vegetation, to brackish and, finally saltwater environments. A fisheries report of the Taunton River, reported a list of over 70 species of fish that turned up with the aid of surveys by seven fisheries experts who sampled the river from the smaller up-stream flow to the saltwater areas.

The watershed supports 29 species of native fish. Tributaries of the Taunton River including the Nemasket River have been noted as one of the most productive warmwater fisheries in eastern Massachusetts. It is also the state's largest and most important Alewife fish run. Another tributary of the Taunton River, the Winnetuxet River, is smaller but has similar characteristics as the Nemasket River with a similar abundance of warmwater fish. Most of the Taunton River is slow moving and silty. However, there are several "riffle" sections with higher velocity, coarse gravel and sand bottom with moderate to dense aquatic vegetation. These areas are a favorable habitat for feeding and reproducing warmwater fish. The most abundant species include: Bluegill, Redfin, Pickerel, American Eel, Pumkinseed, Largemouth Bass and the Golden Shiner.

The existing wildlife habitat within the study area is predominantly a developed urban environment, with natural vegetated habitat essentially limited to relatively small, fragmented forest and grassy areas adjacent to paved roadways, parking lots and buildings. Local public parks include North Park and Bicentennial Park (shown in Figure 2.1) and are of limited size. Wildlife expected to use these patches of natural vegetated habitat include rabbits, chipmunks, squirrels, shrews, moles, raccoons, skunks, fox, coyote and deer as well as various common songbirds, amphibians, and reptiles. Neither the high density residential areas, nor the commercial and industrial zones within the study area are likely to provide significant habitat for wildlife, but still may provide cover and some food sources for more urban-tolerant species.

2.1.7 Existing Threatened and Endangered Species

The Massachusetts Natural Heritage and Endangered Species Program (NHESP) digital data contained on the MassGIS web site were reviewed to identify the potential for threatened and endangered species, as well as critical habitats within the study area. NHESP GIS coverages that were examined include the Priority Resource (21E) Map, the Priority and Estimated Habitats Map, and the NHESP Biomap.

The mapping depicts a contiguous linear zone along the entire length of the Taunton River to the south of the study area that is identified as a rare species priority habitat. There are no other such designations within the study area. The mapped data also indicates general areas where threatened and endangered species and significant habitats could occur, but does not accurately reflect the size and shape of potential or confirmed habitats or populations. Any NHESP sites identified in close proximity to the study area would require coordination with the Massachusetts Department of Environmental Management (DEM) for further assessment of possible project effects during any NEPA or MEPA environmental documentation phase.

Coordination with the U. S. Fish and Wildlife Service (FWS) would also be required. Consultation in accordance with Section 7 of the Endangered Species Act was initiated. A copy of the correspondence is provided in the Appendix.

2.1.8 Existing Areas of Critical Environmental Concern

A review of the Massachusetts Department of Conservation and Recreation's (DCR) digital Areas of Critical Environmental Concern (ACEC) map contained on the MassGIS web site revealed that there are no ACECs within the project study area.

2.1.9 Existing Hazardous Waste Sites

A review of hazardous materials GIS data for the project area identified the locations of two Activity and Use Limitations (AUL) sites. However, no field verification or visual inspection of these locations has been conducted at this conceptual planning stage. AULs are restrictions on the usage of or access to a site in order to prevent or limit potential exposures to chemicals of concern. The sites are located at 1082 Davol Street (former Mechanics Mill site) and Hathaway Street (electric power substation). Figure 2.4 shows local AUL sites overlaid on top of watersheds and water resources. The former Mechanics Mills site recorded a small spill of fuel oil in 1995. The electric power substation reported a release of aromatic hydrocarbons in 2003.

Another site, known as City Pier, located off of Davol Street, was listed as a potential release or threat of a release for aliphatic hydrocarbons and for PCB. Since then the site has been capped, remediated, and the City of Fall River has issued procurement for construction of a Marina.

2.1.10 Existing Cultural, Historical and Archaeological Resources

Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f) states that any federally funded project must "take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register."

The first step in evaluating potential impacts to historic resources is establishing an Area of Potential Effect (APE) for a project. For this study, the APE was defined as the same area as the Focus Area, because it was assumed that the developed alternatives for Route 79 and Davol Street improvements would more than likely not incur any potential impacts beyond this range. This APE has not been reviewed by the Massachusetts State Historic Preservation Office (SHPO), and is only being used as a planning tool to identify potential historic resources that might be affected by any changes to the infrastructure or resulting impacts. The size of the APE would be determined during cultural resources analyses, which would take place during any NEPA or MEPA environmental documentation phases and formal coordination with the SHPO.

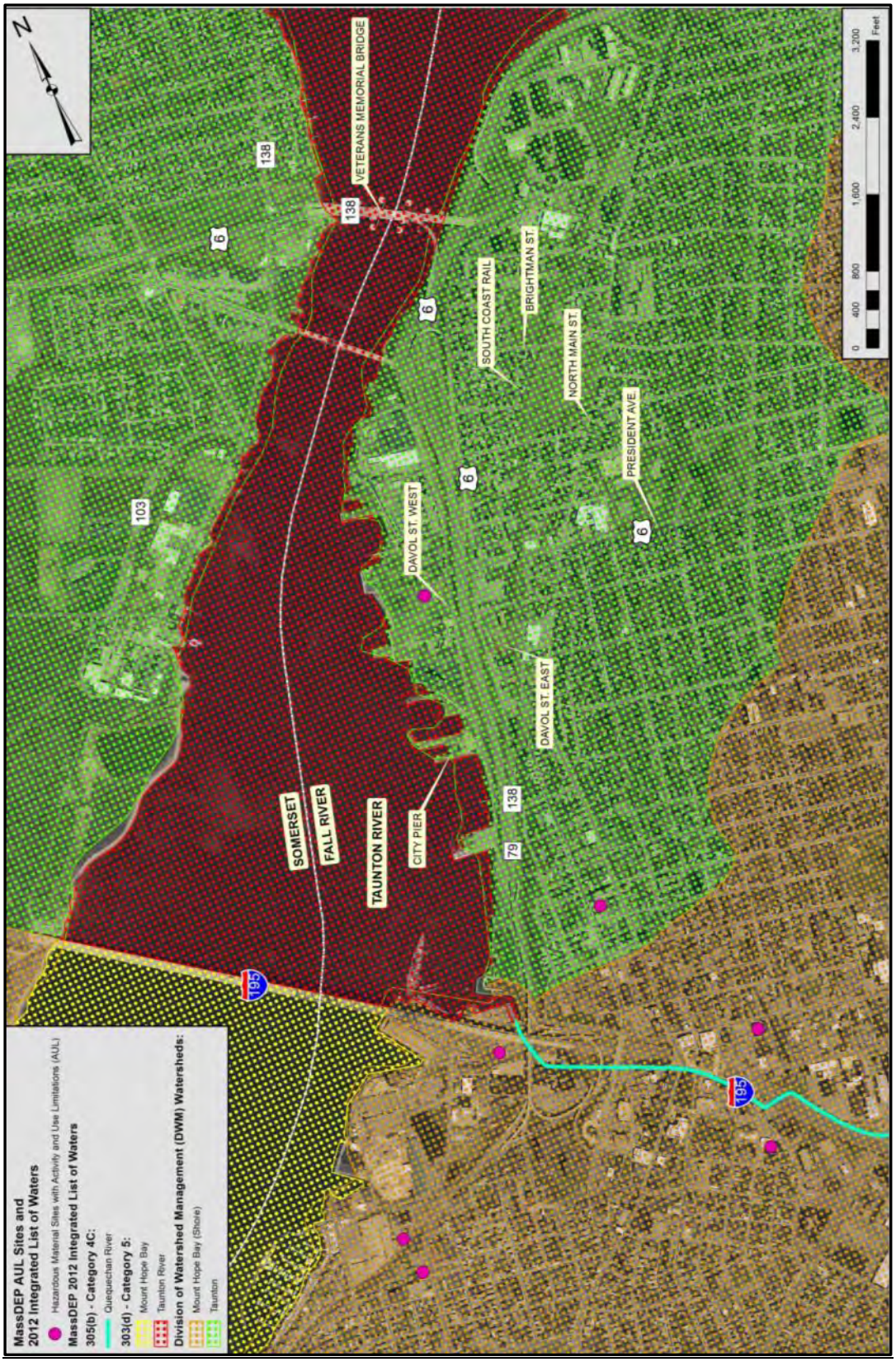


Figure 2.4: Activity and Use Limitations Sites and 2010 Integrated List of Waters

The National Park Service's National Register of Historic Places database was then consulted to determine the presence of any recognized historic sites or districts within the APE. This revealed that no recognized historic sites or districts exist in the vicinity of the study's Focus Area. It should be noted that there may be several resources within the APE that are not "listed on the National Register," but could potentially be eligible. Further field reconnaissance, research, and coordination with the Massachusetts SHPO would be necessary to determine their eligibility as any alternative progresses into the environmental documentation phase required by both NEPA and MEPA. This is particularly true for archaeological resources, which have yet to be defined at this planning stage.

2.1.11 Existing Air Quality

The Clean Air Act of 1970 and subsequent amendments (1990) established National Ambient Air Quality Standards (NAAQS) for six criteria pollutants including carbon monoxide (CO), nitrogen dioxide (NO2), sulfur dioxide (SO2), lead (Pb), ozone, and particulate matter (PM). The Clean Air Act required states to monitor regional air quality to determine if regions meet the NAAQS. If a region exceeds of any of the NAAQS, that part of the state is classified as nonattainment for that pollutant, and the state must develop an air quality plan, called a State Implementation Plan (SIP), that will bring that region into compliance. Until recently, Eastern Massachusetts, which includes Bristol County and Fall River, was classified as serious nonattainment for ozone. On May 21, 2012, the United States Environmental Protection Agency (EPA) designated almost all of Massachusetts including Bristol County as "unclassifiable/attainment" as these areas no longer exceed of the most current ozone standard (2012). The state is considered to be a maintenance area for CO, as it has a history of nonattainment.

Exhaust products of fuel combustion from motor vehicles can contribute to a region's air quality pollutant burden. Emissions vary greatly depending on vehicle type, distance traveled, operating speed, and ambient conditions. For this study, no quantitative air quality analyses were conducted with regard to placing measurement sensors in or around the study's Focus Area. However, a travel demand model was employed to calculate the existing conditions, congestion and delays which increase idling and decrease combustion efficiency, leading to higher emissions. Therefore, any excessive congestion or delay within the study area can be assumed to be a major contributor of poor air quality levels in the study area.

2.1.12 Existing Noise

Noise sensitive land uses include:

- Residences, hotels, and other buildings where people sleep
- Institutional resources such as churches, schools, hospitals, and libraries
- Various tracts of land where quiet is an essential element of the land's intended purpose, such as a National Historic Landmark where outdoor recreation routinely takes place.

Aerial photographs of the study area were reviewed to identify noise sensitive land uses and to obtain a better understanding of the existing noise environment. The Focus Area is in an urban section of Fall River amidst primarily medium and high-density residential neighborhoods that are bisected by Route 79 and Davol Street with many other streets nearby. Residences located to the east of Route 79 and Davol Street in the Lower Highlands neighborhood as well as some on the west side of Route 79 and Davol Street are considered to be the most sensitive receptors to potential noise impacts. Residences further to the east and south of the project study area may also be affected depending on the extent of the alternatives developed, and should be documented as part of the identification of potential issues and constraints.

MassDOT has developed a noise barrier program based on FHWA noise abatement criteria and policies and on MassDOT's noise abatement guidelines. There are essentially two programs; Type I and Type II.

The Type I program covers noise barrier construction coincidental with construction of major highways on new locations, or physical alteration of an existing highway, including widening or realignment. Such major projects usually require an Environmental Impact Statement (EIS) or Environmental Assessment (EA) and/or an Environmental Impact Report (EIR) to comply with the National Environmental Policy Act (NEPA) and the Massachusetts Environmental Policy Act (MEPA). As part of this analysis, the need for a noise barrier is evaluated and if determined to be reasonable and feasible is constructed as part of the project.

The Type II Program is a voluntary effort undertaken by MassDOT to construct noise barriers along existing Interstate roadways where reasonable and feasible and as funding priorities allow. Under this program, MassDOT has identified 53 locations that meet the criteria for consideration of a noise barrier. To-date MassDOT has constructed four of those, has determined that two are not feasible, three are currently being designed, and one other location is being reviewed. The remaining 43 locations will continue to be reviewed to determine if they are feasible and reasonable for construction. Of the 53 locations, there is one located in Fall River but it is not located near the study's Focus Area. Priority Location 11 is focused on the residential areas north of I-195 and west of Route 24 including McGowan Street and East Warren Street. However, depending on the extent of diverted traffic volumes occurring regionally as part of the alternatives analysis, this location will be considered to be a potential constraint. Any noise impacts coincidental with the Route 79 / Davol Street Study would be evaluated under the Type I Program.

2.1.13 Existing Protected and Recreational Open Space

Section 4(f) of the Department of Transportation Act of 1966 (49 USC 303) protects historic resources eligible for listing or listed on the National Register of Historic Places, as well as significant publicly owned parks, recreation areas, and wildlife/waterfowl preserves. Section 4(f) properties may only be impacted if there is no feasible and prudent alternative to their use and if the project includes all possible planning to minimize harm resulting from such use. There is a public park known as Veterans Bicentennial Park located within the study area, between Davol Street and the Taunton River.

2.1.14 Existing Environmental Justice Populations

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, signed by the President on February 11, 1994 directs Federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of Federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law.

Environmental Justice is grounded in the practice of ensuring that both benefits and burdens of transportation investments are shared as equitably as possible among all affected communities. Historically, low-income and minority communities have borne many negative effects of transportation projects and have gained few direct benefits. As a result, efforts to promote Environmental Justice in transportation focus on engaging these communities in transportation decisions. With an awareness and active promotion of the principles of environmental justice in transportation decision-making, practitioners can better avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.

For the purposes of this planning study, census data was reviewed to determine the likely presence or absence of any population centers that meet the definition of minority or low-income populations that would be subject to EO 12898. (These population centers are commonly referred to as "Environmental Justice populations" in the context of EO 12898 and other Federal and State regulations.) This review indicated that both low-income and minority populations live in or near the project study area. Figure 2.5 shows the presence of Environmental Justice populations, including minority populations, low income households and limited-English proficiency households within the project area. Further review of census data indicated a large percentage of the population, approximately one-quarter, considered Portuguese as their primary language.

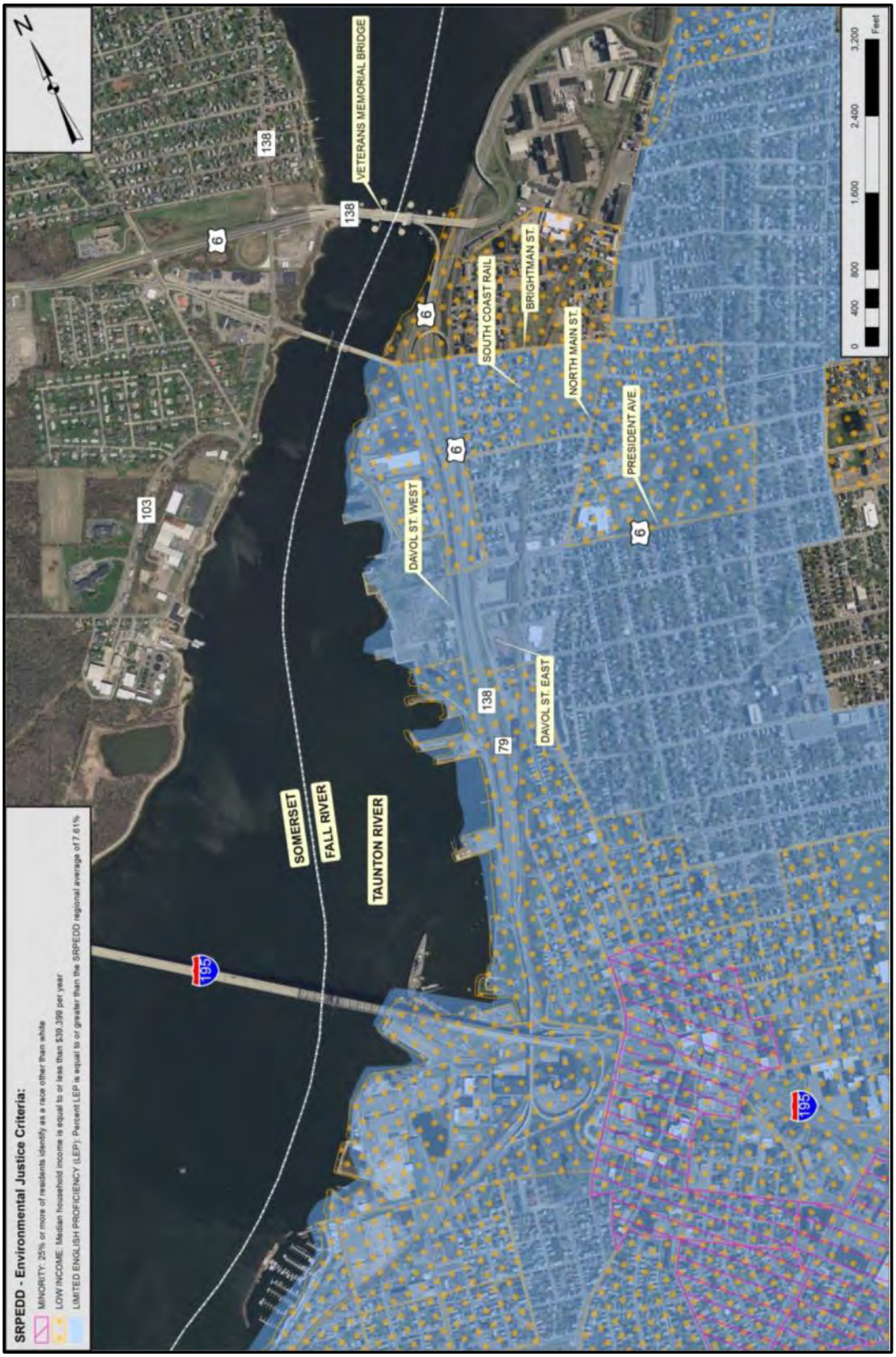

N
VETERANS MEMORIAL BRIDGE
SOUTH COAST RAIL
BRIGHTMAN ST.
NORTH MAIN ST.
PRESIDENT AVE
DAVOL ST. WEST
DAVOL ST. EAST
SOMERSET
FALL RIVER
TAUNTON RIVER
138
6
103
79
195
0 400 800 1,600 2,400 3,200 Feet
SRPEDD - Environmental Justice Criteria:
MINORITY: 25% or more of residents identify as a race other than white
LOW INCOME: Median household income is equal to or less than $39,398 per year
LIMITED ENGLISH PROFICIENCY (LEP): Percent LEP is equal to or greater than the SRPEDD regional average of 7.61%

Figure 2.5: Environmental Justice Populations

2.2 Existing Economic Conditions and Analysis

Within the city and metropolitan area of Fall River and Bristol County, demographic and economic trends were analyzed as well as real estate market trends, examining housing, industrial, office and retail markets. The analysis was completed using information from the US Census Bureau, the Bureau of Economic Analysis, assessor's records, LoopNet, Zillow and field survey. Existing land use patterns within the study area were examined and their contribution to the City's tax base was also assessed. This information will primarily be used to project the future supply of sites under the Future No-Build conditions, but also to identify any issues, constraints or opportunities that will guide the alternatives development and analysis.

2.2.1 Demographic Trends

Within the 1.2 mile study corridor, there are few residential areas. The population of the study area is estimated to be 200 people. Nearly 90% of residents live in the waterfront Point Gloria Condominiums, a development of 118 units with many long-term owners. The Hathaway Street neighborhood, with just six houses, contains most of the rest. The population of the study area is anticipated to increase when the upper three floors of Commonwealth Landing Mill on the waterfront are developed into 70 to 80 new apartments.

Table 2.1 shows demographic, social, economic trends within the City of Fall River over the past decade in comparison to statewide averages. Fall River's population has fallen from nearly 92,000 in 2000 to its present level of 88,900, a reduction of 3% compared to a 1% loss statewide. Despite the 3% drop in population, the number of households and families has decreased by just 1%, highlighting a trend toward smaller households. Roughly one-fifth of Fall River's population is foreign-born, higher than the state average of 17% and one-third speak a language other than English at home. The mean travel time to work is 22 minutes, suggesting that the typical worker commutes from Fall River to work. In addition, there are more employed people in Fall River than there are jobs in Fall River.

2.2.2 Economic Characteristics

As shown in Table 2.1, Fall River's civilian labor force has dropped by 3% during the past decade while the number of unemployed workers rose by nearly 3,000 to 5,889. In 2010, the unemployment rate in the City stood at 13.2%, almost double the State average rate, but by August 2012, it had been reduced to 12.4%. The median household income in the City rose by 18% but at $34,236 is roughly half of the State average of $65,500. The percentage of households below poverty level (with incomes of less than $23,050 for a family of four) rose from 16% to 20% over this timeframe and is significantly higher than the Massachusetts average 11% poverty rate.

Table 2.1: Fall River Demographic, Social and Economic Statistics from 2000 to 2010

Fall River Compared with State Averages					
Demographics		2000	2010	% Change	State Avg. 2010
	Population	91,938	88,857	-3%	3.1%
	Median Age	36	38	6%	39
	% White	91%	87%	-4%	82%
	% Black	3%	4%	33%	7%
	% Asian	2%	3%	50%	5%
	% Latino	3%	7%	133%	9%
	Households	38,759	38,457	-1%	-
	Families	23,558	23,391	-1%	-
Social Characteristics					
	High School Graduate or more	57%	68%	19%	89%
	B.A. or higher	11%	14%	27%	38%
	Foreign Born	20%	21%	5%	17%
	Speak English at home	65%	67%	3%	79%
Economic					
	Employed Civilian Labor Force	39,647	38,613	-3%	-1%
	Mean Travel Time to Work	22 min	22 min	0%	27%
	Number unemployed	2,973	5,889	98%	72%
	% Unemployed	7.0%	13.2%	89%	7%
	Median Household Income	$ 29,014	$ 34,236	18%	$ 65,509
	Median Family Income	$ 37,671	$ 44,498	18%	$ 811,165
	Per capita Income	$ 16,118	$ 20,337	26%	$ 33,966
	Median salary - males	$ 31,330	$ 41,726	33%	$ 57,045
	Median Salary - females	$ 22,883	$ 31,300	37%	$ 44,522
	Percent below poverty	16.0%	20.0%	25%	11%
	% Receiving Food Stamps	-	20.0%	-	8%

Source: US Census Bureau, American Factfinder

2.2.3 Labor Force Employment Structure

Table 2.2 shows trends in the occupational and industrial structure of the labor force of Fall River, comprised entirely of residents of Fall River who work both in the City and in other areas. In comparison with the State averages, a low proportion of Fall River's labor force are in professional and managerial jobs, while a large proportion of workers are in construction, production, and transportation jobs. Except for a 25% drop in production and transportation jobs, Fall River's occupational structure saw little change from 2000 to 2010.

Between 2000 and 2010, the biggest change in the industrial sector was in manufacturing. It was Fall River's biggest employer in 2000, employing 24% of the labor force. By the end of the decade, only 15% of Fall River's residents were employed in manufacturing industries. Outside of manufacturing, Fall River's biggest employers are Retail, Education, Health and Social Services.

Table 2.2: Fall River Occupation Statistics from 2000 to 2010

Employment Structure of Fall River by Occupation and Industry Compared to State Averages				
Occupation	2000	2010	% Change	State Avg 2010
Management & Professional	22%	24%	9%	43%
Services	19%	21%	11%	17%
Sales & Office	25%	27%	8%	24%
Construction	10%	11%	10%	7%
Production & Transportation	24%	18%	-25%	9%
Industry				
Construction	6%	8%	33%	6%
Manufacturing	24%	15%	-38%	10%
Wholesale Trade	4%	3%	-25%	3%
Retail	13%	14%	8%	11%
Transportation & Utilities	3%	4%	33%	4%
Information	2%	1%	-50%	3%
FIRE	5%	5%	0%	8%
Professional & Scientific	6%	8%	33%	13%
Education, Health, & Social Services	21%	25%	19%	27%
Arts, Entertainment, Hotels, Restaurants	7%	7%	0%	8%
Public Administration	4%	4%	0%	5%

Source: US Census Bureau, American Factfinder, Selected Economic Characteristics of the Population

2.2.4 Workforce Data – Companies in Fall River

The workforce is comprised of those working at firms located in Fall River who live throughout the commuter shed. Table 2.3 shows trends in sales and jobs at firms located in Fall River. The number of firms in Fall River has decreased by 5% and the number of jobs has dropped by 1,400, which is an 11% loss. However, sales grew by 7%, indicating significant productivity gains. Statewide, the manufacturing sector performed worse, losing 17% of jobs and 12% of factories. Similar to the trend observed in Fall River, statewide sales of manufacturing firms actually increased by 10% despite the heavy losses of firms and jobs.

Table 2.3: Company Trends in Fall River 2002 to 2007

Employment, Firms, & Sales in the City of Fall River 2002-2007									
	2002			2007			% Change		
	Firms	Sales ($1000)	Jobs	Firms	Sales ($1000)	Jobs	Firms	Sales	Jobs
Manufacturing	195	1,706,441	11,707	164	1,060,134	6,067	-16%	-38%	-48%
Wholesale Trade	84	359,035	1,346	76	727,764	1,642	-10%	103%	22%
Retail Trade	330	754,439	3,436	298	931,222	3,488	-10%	23%	2%
Information	11	N/A	511	16	N/A	641	45%	N/A	25%
Real Estate, Rental & Leasing	92	54,179	338	87	61,792	339	-5%	14%	0%
Professional, Scientific & Technological	163	59,721	651	170	72,904	728	4%	22%	12%
Waste Management & Removal Services	79	123,733	1,517	73	109,489	1,103	-8%	-12%	-27%
Educational Services	10	12,819	167	9	N/A	99	-10%	N/A	-41%
Health Care and Social Assistance	289	648,108	9,687	290	920,287	11,078	0%	42%	14%
Arts, Entertainment, & Recreation	18	12,593	297	17	13,847	192	-6%	10%	-35%
Accommodation and Food Services	173	N/A	1,750	181	105,514	2,574	5%	N/A	47%
Other Services (except public admin.)	196	60,594	881	174	62,010	925	-11%	2%	5%
Totals	1,640	3,791,662	32,288	1,555	4,064,963	28,876	-5%	7%	-11%

Source: 2002 and 2007 Economic Census (US Census Bureau)

2.2.5 Employment Trends in Bristol County

Table 2.4 compares changes in employment within the larger Bristol County area over the past decade with state average trends. Unlike the Census data, these data include self-employed individuals. From 2001 to 2010, salaried jobs fell by over 13,000 in Bristol County, but this was offset to some extent by a gain of over 9,000 self-employed workers. This trend has occurred throughout the state and the nation during the recession of the past five years.

Mirroring the city data, the heaviest losses were sustained in the manufacturing sector. The second hardest-hit sector by the recent recession has been construction. Significant job gains were recorded in financial services, insurance, and real estate, which posted increases of nearly 40%, exceeding statewide gains and creating over 5,300 new jobs for Bristol County residents. Health care saw a 20% increase, equaling the state average growth in healthcare occupations. Jobs in education grew by 37%, which is twice the statewide average growth rate of 15%.

Table 2.4: Employment Trends in Bristol County

	2001	2010	Bristol Co. Change in Jobs	Bristol Co. % Change	State % Change
Total employment	270,156	266,000	-4,156	-2%	1%
By type					
Wage and salary employment	229,940	216,479	-13,461	-6%	-4%
Proprietors employment	40,216	49,521	9,305	23%	28%
Farm proprietors employment	603	680	77	13%	13%
Nonfarm proprietors employment	39,613	48,841	9,928	23%	28%
By Industry					
Farm employment	1,222	1,049	-173	-14%	-4%
Nonfarm employment	268,934	264,951	-3,983	-1%	1%
Private employment	239,719	236,305	-3,414	-1%	1%
Forestry, fishing, and related activities	3,100	3,324	224	7%	-1%
Mining	130	57	-73	-56%	15%
Utilities	838	854	16	2%	-11%
Construction	15,504	14,251	-1,253	-8%	-11%
Manufacturing	43,139	25,253	-17,886	-41%	-33%
Wholesale trade	12,098	12,361	263	2%	-11%
Retail trade	40,079	37,888	-2,191	-5%	-4%
Transportation and Warehousing.	6,114	7,457	1,343	22%	-7%
Information	4,649	3,957	-692	-15%	-20%
Finance and insurance	7,420	10,140	2,720	37%	15%
Real Estate	6,883	9,490	2,607	38%	29%
Professional, scientific, and technical services	11,337	11,839	502	4%	6%
Management of companies and enterprises	3,150	3,554	404	13%	-16%
Administrative and waste management services	11,430	11,731	301	3%	3%
Educational services	3,913	5,370	1,457	37%	15%
Health care and social assistance	32,875	39,381	6,506	20%	20%
Arts, entertainment, and recreation	4,326	4,929	603	14%	21%
Accommodation and food services	18,655	20,218	1,563	8%	10%
Other services, except public administration	14,079	14,251	172	1%	2%
Government and government enterprises	29,215	28,646	-569	-2%	-1%
Federal, civilian	1,195	1,376	181	15%	-4%
Military	1,772	1,416	-356	-20%	-8%
State and local	26,248	25,854	-394	-2%	0%
State government	5,219	6,604	1,385	27%	1%
Local government	21,029	19,250	-1,779	-8%	0%

Source: Bureau of Economic Analysis, REIS Data

2.2.6 Unemployment in Fall River Metro Area

The most current count available from August 2012 shows that there are approximately 71,800 unemployed people living in the Fall River Metro Area. This is a 10% decrease in the rate compared with the peak levels of unemployment that were reached in 2010. Unemployment in the area now stands at 10.4%, the same as Rhode Island's rate. This is above the Massachusetts state average rate of 6.3%, but closer to the national average of 8.1%.

2.2.7 Housing Stock

Table 2.5 examines characteristics of the housing stock within the City of Fall River from 2000 to 2010. While total housing units in Fall River have slightly increased over the decade, the portion of owner occupied housing has decreased. A larger portion of housing units are now renter occupied as a result of poor housing market conditions. Average housing values in the City climbed by 36% to approximately half the statewide average. Over the same timeframe, average rents in Fall River have risen and roughly match the state average rent. Just 2% of owner-occupied housing is vacant, compared with 10% of rental housing. A good supply of rental housing is a positive condition for economic growth as it means that there are ample affordable housing choices for new workers entering the community.

Table 2.5: Fall River Housing

Fall River Housing Stock 2000-2010 Compared with State Averages				
	2000	2010	% Change	Mass Avg. 2010
Total Housing Units	41,857	42,750	2%	0%
Median House Value	$132,900	$181,000	36%	$352,300
Median Rent	$428	$649	52%	$670
% Owner-occupied Housing	65%	64%	-2%	64%
% Renter-occupied Housing	35%	36%	3%	36%
% Homeownership Vacancy	1%	2%	NA	1%
% Rental Vacancy	7%	10%	43%	6%

Source: US Census Bureau, 2010 housing values from Zillow

2.2.8 Commercial Real Estate Market Trends

Figures 2.6 through 2.8 compare trends in industrial, office, and retail real estate prices in the Fall River area with those in the state since 2006, which should be noted is before the onset of the last recession. In both Massachusetts and the City of Fall River, sale prices for industrial properties, as seen in Figure 2.6, peaked in late 2007 and have since decreased for both the state and the metropolitan area. Asking prices for industrial buildings are averaging $53 per square foot in the Fall River metro area, about 15% below the statewide average.

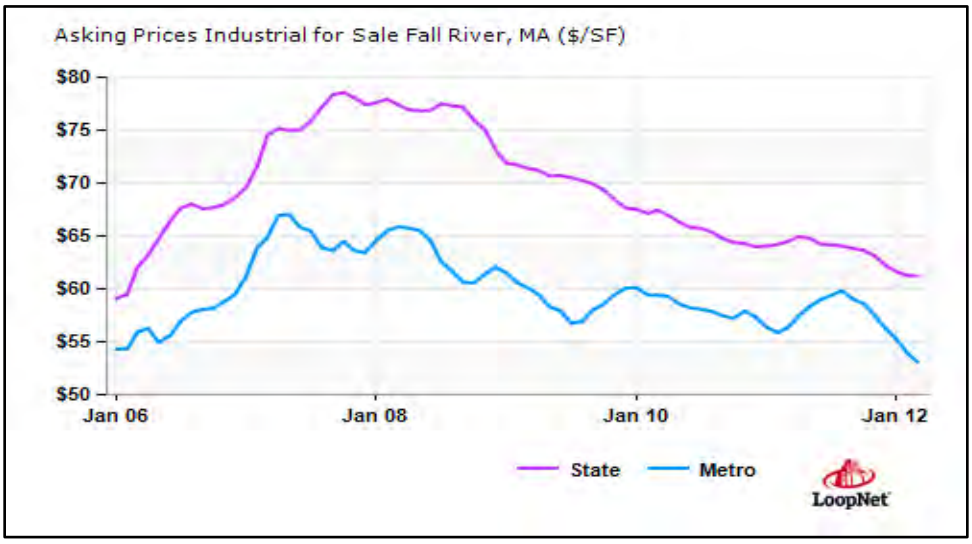


Figure 2.6: Commercial Real Estate Trends

Within the Davol Street Study area, there are currently two commercial properties listed for sale. These include a one-half acre waterfront industrial site on Remington Avenue behind Performance Auto Center and a 53,400 sq. ft. industrial building with Class C space at 609 Davol Street. This site is currently occupied by a U-Haul rental dealer and a storage business, and is constrained by access and circulation limitations as the building is located immediately behind the sidewalk and has limited parking opportunities.

Figure 2.7 shows asking prices for office space in the Fall River metro area and in the state. In 2006, office prices in the Fall River metro were about the same as the state average office sale prices at about $140 per square foot. Since then, office prices have since fallen by 25% in Fall River. At the state level, prices slumped by roughly 15%. Due to the newly converted Commonwealth Landing Mill, there is an excellent supply of office space for rent in the study area. Class A+ space is provided in the newly converted Commonwealth Landing Mill and Class B space is available in the Hague Sahady building at the Northeast corner of President Avenue and Davol Street.

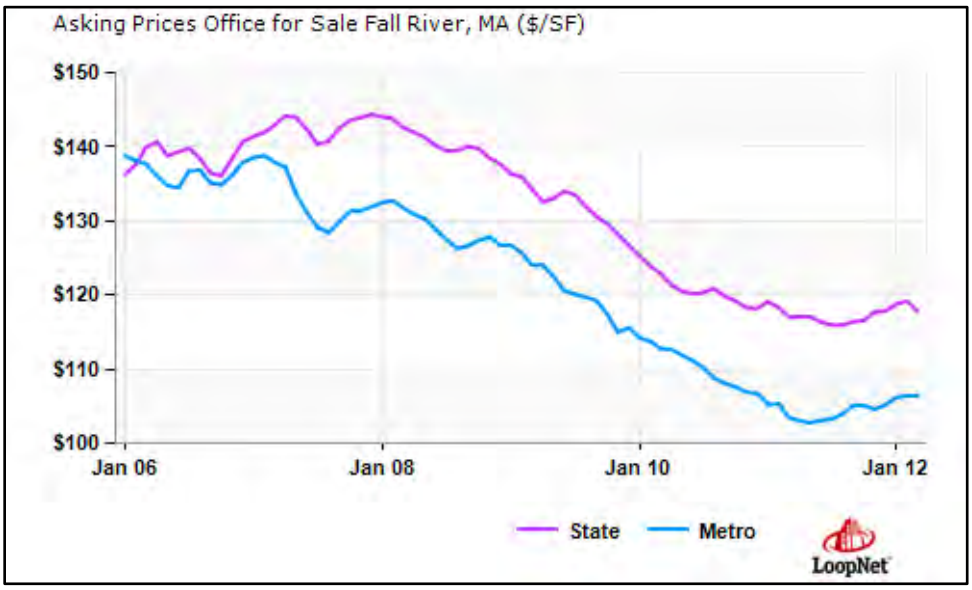


Figure 2.7: Trends for Office Space Asking Sale Price

Figure 2.8 shows trends in sales prices for retail properties in Fall River over the past six years. Retail prices in Metro Fall River have been relatively stable over this period. Those in Bristol County, however, peaked during the first half of 2008, which in most places was a very tough period for commercial real estate. Retail sales prices in Bristol County boomed again during 2011, increasing from $122 per square foot to $160 per square foot, but these data are likely based on a small number of property sales.

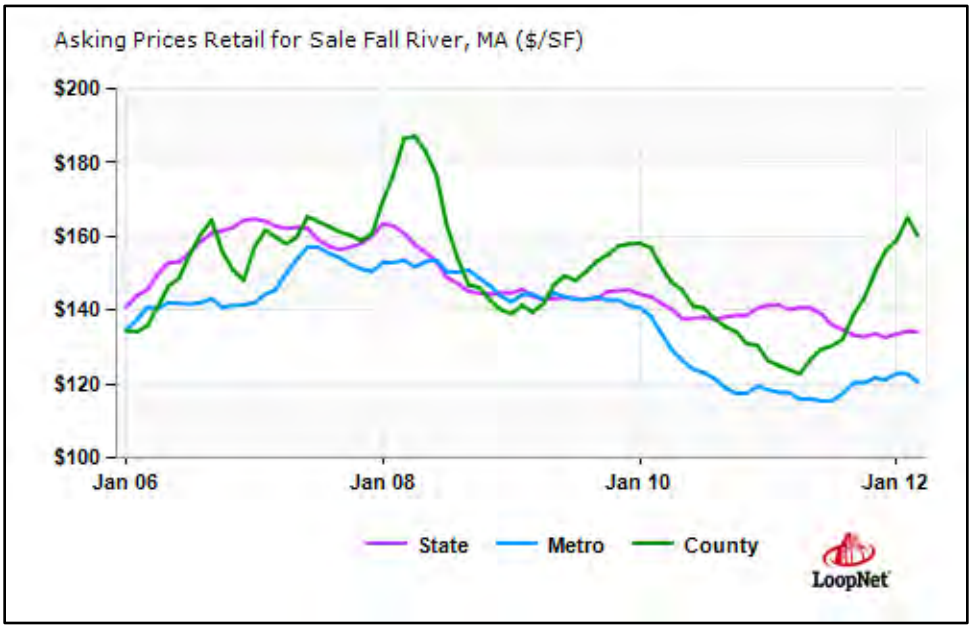


Figure 2.8: Trends for Retail Space Asking Sale Price

2.2.8.1 Existing Commercial Real Estate Locations

Within the study area, existing retail space is clustered around the intersection of President & Davol Street. The 40,000 square foot Executive Plaza strip mall has 12 tenants. Vacancy at the Plaza is just over 15%. There are 4,000 square feet of retail space on the north side of President Avenue in four units that are owned by the J&B Hockey and Sporting Goods store's proprietor.

The Commonwealth Landing complex consists of multiple buildings between Davol Street West and the waterfront and supports restaurant and office space as well as residential units. Jerry Remy's Sports Bar and Grill recently opened in a 4,700-square-foot waterfront building within the complex. Red Cedar, a federal hill-style Italian Restaurant with indoor and outdoor courtyard seating also opened this fall in Commonwealth Landing.

2.2.9 Land Uses in the Study Area

Industrial uses are the most dominant in the study area, occupying over 35% of study area acreage. Retail represents 22% of land uses, is the second most dominant, and is concentrated in and around Executive Plaza at the corner of Davol St. and President Ave. Office, with 9% of the total acreage and residential, with 7%, are the least-intensive land uses in the study area but are likely to offer the best prospects for future redevelopment of the waterfront.

Table 2.6 provides a parcel-by-parcel listing of existing properties within the study's Focus Area with information on occupancy and use. It shows that there are a total of nearly 50 acres on the waterfront side of Davol Street West. Major land uses include the National Grid Substation and Bicentennial Park. The largest private user is AIRTEC, which occupies nearly seven acres. Due to the very shallow configuration of sites on the east side of Davol Street East, just 16 acres of sites are located on the side where the South Coast Rail Station is planned. Most of this area – 10.3 acres – is occupied by Executive Plaza Shopping Center.

Table 2.6: Land Uses within the Davol Street Corridor

Land Uses in the Study Area			
Site	Address	Acres	Use
Davol Street – Waterfront Side			
Seaboats	1338 Davol St.	4.4	Industrial
AIRTEC/Rectoseal	1244 Davol St.	6.9	Industrial
Performance Auto	1190 Davol St.	2.1	Auto Repair
Vacant shop/Office	204 Remington St.	0.6	Auto Repair
3 Family - For Sale	223 Remington St.	0.2	Residential-MF
Commonwealth Landing Mill	1082 Davol St.	5.6	Office
Bicentennial Park	Davol Street	7.7	Recreation
National Grid Substation	1 Hathaway St.	10.8	Utility
Patenaude Office Building	800 Davol St.	0.3	Office
6 Houses in Hathaway Neighborhood	28-61 Hathaway St.	1.3	Residential-MF
Point Gloria Condo	750 Davol St.	2.7	Residential-MF
City Pier	600 Davol St.	5.0	Vacant
Regatta Club	392 Davol St.	2.2	Vacant – Nightclub
	Subtotal - Waterfront Side	49.8	Acres
Davol Street – Station Side			
Mobile Station	431 Davol St.	0.3	Retail
Shallow Lot	535 Davol St.	0.2	Vacant
Class C Mill Space	577 & 609 Davol St.	0.6	Industrial-Storage
Davol Station Café	697 Davol St.	0.1	Retail-Bar
4 Unit Apartment Building	713 Davol St.	0.1	Residential-MF
Jimmy's Used Tires	729 Davol St.	0.2	Auto Repair
Teknikor	753 Davol St.	0.4	Industrial
Station Site	775 Davol St.	1.5	Vacant -Ind.
Pawnbroker Storage Bldg.	825 Davol St.	0.8	Industrial-Storage
Executive Plaza	1696 President Ave.	10.3	Retail
Fruit & Flowers Store	179 President Ave	0.3	Retail-Vacant
Abrite Cleaners	181 President Ave.	0.3	Retail
Hague Sahady Building	1741 President Ave.	0.3	Office
Globe Liquors	180 President Ave.	0.9	Retail
	Subtotal Station Side	16.3	Acres
	Total Study Area	66.0	Acres

Source: Field Survey conducted by Cambridge Economic Research

2.2.10 Assessed Values and Property Taxes

Values of properties in the Study Corridor total $42.8 million, averaging $138,062 per acre. The waterfront side of Davol Street comprises over 70% of the total assessed values since it has more buildings and land area. However, assessed values per acre on the east side of Davol Street East are almost double those on the waterfront side of Davol Street West. This is partly

because the sites along Davol Street East are very small – most are under an acre. Small sites generally have higher values per acre than do large sites. Over 40% of the total assessed value, nearly $18 million is accounted for by Point Gloria Condominiums. Executive Plaza, assessed at $7.6 million, represents another 20% of the Davol Street Study Area's total assessed valuation.

Table 2.7 shows the study area is a net contributor to the city's tax base. Property taxes generated by parcels in the study area generate over $900,000 in annual revenues to the city. This is 1.3% of the city's property tax base in an area that occupies just 0.3% of the city's land area. Ninety percent of property taxes are from commercial properties. The only properties taxed at the residential rate are the six single family houses on Hathaway Street and 40% of the units in Point Gloria.

Table 2.7: Study Area Tax Generation

Property Taxes Generated within the Study Area	
No. of Commercial Parcels	23
Assessed Value	$34,560,240
Commercial Tax Rate (per $1000)	23.54
Subtotal - Commercial Tax	$813,548
Total Residential Parcels	7
Assessed Value	$8,286,160
Residential Tax Rate (per 1000)	10.98
Subtotal - Residential Tax	$90,982
Total Residential & Commercial Taxes	$904,530
% of Fall River Property Tax Base	1.3%
% of City's Land Area	0.3%
Note: Point Gloria is classed as 40% residential & 60% commercial due to the mix of owner/renter units.	

Source: Field Survey and Fall River Assessors Records

2.2.11 Existing Businesses in the Study Area

To gather baseline information for projections of the land use and economic impacts of alternatives for improving Route 79, a survey of firms in the study area was conducted. The focus of the survey was to gauge the likely future of the firms in the area in order to estimate the future supply of sites that might be expected to become available for redevelopment in the coming years. The survey includes firms in the immediate study area as well as tourist-serving businesses on the fringes of the study area that are likely to be affected by the alternatives for improvements on Route 79. The latter include Battleship Cove Community Boating, Fall River Heritage State Park, the USS Battleship Massachusetts, the Tilotsen Complex, the Marine Museum, and the Borden Light Marina on the Riverfront side of Davol Street. On the east side of Davol Street, Michael's Provisions, a popular Portuguese grocer that draws customers from throughout the region, is included.

Table 2.8: Study Area Business Survey

Survey of Businesses in the Wider Study Area			
Firm	Person interviewed	Sector	Jobs
Davol Street West			
Seaboats	Scott Church	Boat Builders	15
Rectoseal (AIRTECH)	Scott Barboza	HVAC Mfg.	50
Performance Auto	Mike Camera	Towing & Repairs	1
Commonwealth Landing Mill	Alan Macomber	Mixed Use	200*
Hathaway St. Office Bldg.	Roland Patenaud	Realtor	3
Point Gloria Condominiums	Cheryl Darnboro	Residential Condos	2
Battleship Cove Community Boating	Doug Young	Recreation	6
Fall River Heritage State Park	Robert Horton	Recreation	3
USS Battleship Massachusetts	Brad King	Recreation	6
Borden & Remington (Tilotson)	Robert Bogan	Large, underused site	45
Marine Museum	Paul Sinister	Recreation	2
Borden Light Marina	Mike Lund	Recreation	4
Subtotal Davol Street West			337
Davol Street East			
609 Davol St. - 3 vacant mill bldgs.	Vasco Cabral	Class C com'l. space	3
Davol Station Café	Steve Tagee	Bar	6
Jimmy's Used Tires	Jimmy Raposa	Auto service	3
TekniKor (at Davol Station Site)	Cliff Gillette	Electrical Mfg.	60
Spindle City Precious Metals	NA	Gold Merchant	NA
Executive Plaza - Kale Realty (owner)	Faith Kaplan	Strip Mall	70
Battleship Brewhouse	Cornell Leigh	Restaurant	12
Appliance World	Manuel DiMello	Retail	7
South Baptist Thrift Shop	Kristina Costa	Retail	8
Al Mac's	Dawn Gauthier	Restaurant	20
JB Hockey & Sports Store	Bruce Morrow	Retail	3
Irish Specialty Shoppe	Joseph Reilly	Retail	1
Hague Sahady & Co., CPA & Tenants	Mr. Hague	CPA's	29*
Michael's Provisions	Ronnie Miranda	Retail	16
Subtotal Davol Street East			238
Total Jobs in Wider Study Area * Includes tenant jobs within these office buildings			575

Our survey showed that there are a total of 575 jobs within the wider study area. This represents about 2% of city's total employment (32,300). About 60% of jobs are on the waterfront side of Davol Street. The largest employer is Teknikor, with 60 workers. Two-thirds of businesses in the study corridor employ fewer than 20 staff.

Businesses encompass a wide spectrum of industries. The most-dominant are recreation and tourism. Tourist-serving businesses are located just south of the study area and include the Heritage State Park, Battleship Cove, and Borden Light Marina. They were included in the survey because they are likely to affect and be affected by any redevelopment activity that occurs within the study area. The second most-common type of businesses is retail. Shops and restaurants are clustered around Executive Plaza and Commonwealth Landing Mill.

The study area's two largest employers are successful manufacturing firms whose markets are growing. These include AIRTEC/Rectoseal, a manufacturer of HVAC equipment who has been at the site since 2001. It also includes Teknikor, an electrical engineering systems contractor who occupies part of the site on the east side of Davol Street that is proposed for the South Coast Rail Station. Both firms are growing and could potentially benefit by being in buildings on larger sites. Professional service firms are a conspicuously small proportion of the total but offer the best prospects for future job growth in Fall River. Six professional services firms employing a total of 29 people are clustered in the Hague-Sahady Building at the corner of President and Davol Street across from Executive Plaza. The tenants in the office space at Commonwealth Mill are in the education and healthcare industries.

Businesses were asked about their financial performance and if they were growing, stable, or declining. The results are summarized in Figure 2.9, which shows business outlook by proportion of study area jobs. Firms providing nearly 90% of jobs in the wider study area report that their businesses are performing well and that they expect to grow. Firms providing 5% of jobs in the area say their employment is stable to declining slightly, which corresponds to the "fair" category. Only 8% of the study area's jobs are in firms whose business is declining and who are pessimistic about the outlook for the future of their businesses in Fall River.

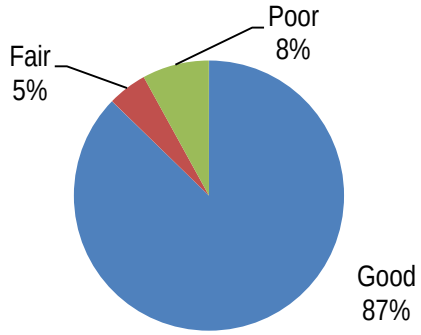


Figure 2.9: Outlook for Businesses in the Study Area
(% of Jobs Based on Business Reported Future Outlook.

2.3 Existing Transportation Conditions

The existing transportation conditions for this study were defined for two areas: the Regional Transportation Impact Area and the Focus Area. The Regional Transportation Impact Area encompasses a triangle shaped area in Fall River bounded by Route 79, Route 24 and I-195. The Focus Area, located within the Regional Transportation Impact Area, includes Route 79 and the Davol Street corridors from Cedar Street to the interchange of Route 79 with U.S. Route 6.

2.3.1 Existing Roadway Geometry and Conditions – Focus Area

The Focus Area of the Route 79 / Davol Street Corridor Study extends from the Cedar Street U-turn underneath Route 79 to the interchange between Route 79 and U.S. Route 6 near the Veterans Memorial Bridge. Along this length, Route 79 provides two lanes in each direction separated by a grass median. Northbound Route 79 has an exit ramp to Davol Street East just north of President Avenue that provides access to Brightman Street, Davol Street West and Southbound Route 79. Davol Street East merges with Northbound Route 79 north of the U.S. Route 6 interchange and north of the Focus Area. Southbound Route 79 has an exit ramp to Davol Street West just south of the U.S. Route 6 interchange. Eastbound U.S. Route 6 splits into two ramps to travel northbound and southbound. The southbound ramp provides access to both Southbound Route 79 and Davol Street West. Route 79 is part of the National Highway System.

Davol Street West is located along the western side of Route 79 and is formed by two ramps coming from the Veterans Memorial Bridge and an off-ramp from Route 79. Davol Street West carries two lanes with parking along the west edge of pavement. A sidewalk is also provided along the western edge of pavement. Davol Street West is entirely located within the project Focus Area and provides access to Commonwealth Landing, Bicentennial Park, Point Gloria, Heritage State Park and Battleship Cove. U.S. Route 6 follows Davol Street West from the Veterans Memorial Bridge to President Avenue. The speed limit along Davol Street West is 40 miles per hour.

Davol Street East carries two lanes from its beginning at Central Street to its end north of Brightman Street where it provides access from Fall River to Route 79 and U.S. Route 6 in Somerset. No parking is provided along Davol Street East. A sidewalk is provided along the roadway from the Cedar Street U-turn to Brownell Street. U-turns connecting Southbound and Davol Street East are provided near Cedar Street and Brightman Street. The speed limit along Davol Street East is 40 miles per hour.

There are two Taunton River crossings within the project Focus Area. The first is the former Brightman Street Bridge, which is now closed to traffic. Further north is the Veterans Memorial Bridge which was completed in 2011 and was built to replace the Brightman Street Bridge. The Veteran's Memorial Bridge carries U.S. Route 6 and Route 138, with connecting ramps to Route 79, and also includes a wider walkway and bikeway and includes a fishing pier.

2.3.2 Existing Roadway Geometry and Conditions – Regional Transportation Impact Area

The National Highway System (NHS) consists of roadways essential to national economics, defense and mobility. The NHS includes interstates, principal arterials, and intermodal connectors. Within the Regional Transportation Impact Area, Route 24, Route 79 and President Avenue are classified on the NHS as Other Roads, as seen in Figure 2.10. I-195 is considered part of the Interstate System within the NHS. U.S. Route 6 and President Avenue between Davol Street West and Davol Street East were included in the NHS as part of MAP-21, the federal comprehensive surface transportation program, as it is considered an Urban Principal Arterial. South of I-195, the roads surrounding the Fall River Southeastern Regional Transit Authority (SRTA) Bus Terminal. I-195 is classified as an Interstate while Route 24 and Route 79 have the functional classification of Principal Arterial. The Veterans Memorial Bridge and President Avenue are Urban Principal Arterial roadways. Davol Street East, Davol Street West, Turner Street and Brightman Street are considered Urban Minor Arterials. All other roadways are local roadways.

Figure 2.10: NHS Roadways within the Regional Transportation Impact Area

I-195 is an east-west interstate that provides three lanes in each direction with a barrier median and a speed limit of 55 miles per hour. Route 24 is a divided highway that carries two lanes in the northbound and southbound directions with a grass median and a speed limit of 65 miles per

hour. Route 79 is a divided highway with two lanes in the northbound and southbound directions. The highway is divided by a grass median north of Cory Street and a barrier median south of Cory Street. The speed limit along Route 79 between I-195 and Route 24 is 55 miles per hour.

President Avenue begins at Davol Street West and continues east to its terminus at the rotary with North Eastern Avenue. U.S. Route 6 follows President Avenue along its entire length and continues southward along North Eastern Avenue. West of North Main Street, President Avenue provides two lanes in each direction. East of North Main Street, President Avenue provides one lane in each direction with parking along each side of the road. Sidewalks are provided along each side of the road. The speed limit along President Avenue is 30 miles per hour.

2.3.3 Existing Intersection Geometry

Within the Focus Area and Regional Transportation Impact Area, the intersections along Davol Street West, Davol Street East and President Avenue provide local and regional access and interconnectivity. This section serves to further detail existing conditions at each intersection along these roadways, in order to better identify existing issues, opportunities and constraints.

2.3.3.1 Intersection Geometry – Davol Street West

Davol Street West has only one signalized intersection throughout its length, which is at President Avenue. All other intersections with driveways and sidestreets are unsignalized. The sidestreet or driveway is stop controlled while Davol Street West has free movement. At each intersection, Davol Street West has two 11-foot wide lanes in the southbound direction and no exclusive turning lanes. Wheelchair ramps are provided along the western side of Davol Street West at each intersection, but none of the ramps meet current MassDOT and Americans with Disabilities Act (ADA) design standards. More detailed information is provided below regarding the intersections of Davol Street West with the Brightman Street U-turn, Brownell Street, Taylor Street, Baylies Street and the Cedar Street U-turn. Information for the intersection with President Avenue is provided in Section2.3.3.3, Intersection Geometry – President Avenue.

Davol Street West at Brightman Street U-turn

The Brightman Street U-turn is located at the beginning of Davol Street West. The U-turn is located roughly 200 feet after the end of the ramps from U.S. Route 6 and Southbound Route 79. Each ramp forms one lane of Davol Street West. The U-turn provides access to Northbound Route 79, U.S. Route 6 in Somerset and Brightman Street. No deceleration lane is provided for the U-turn ramp. See Figure 2.11 for a graphic of this location.

Figure 2.11: Davol Street West at Brightman Street U-turn

Davol Street West at Brownell Street

Brownell Street, as seen in Figure 2.12, is a two-way road with one lane in each direction and parking on each side. Commonwealth Landing is located on the north side of Brownell Street and the roadway also provides access to a parking lot for Bicentennial Park and the Iwo Jima Memorial. Brownell Street is stop controlled and while sidewalks are present along the west side of Davol Street West, no crosswalk is painted across Brownell Street.

Figure 2.12: Davol Street West at Brownell Street

Davol Street West at Taylor Street

Taylor Street, as seen in Figure 2.13, is a narrow two-way road, roughly 25 feet wide, that provides access to the Point Gloria Condominiums and a small number of homes. Taylor Street is stop controlled and no crosswalk is present.

Figure 2.13: Davol Street West at Taylor Street and Baylies Street

Davol Street West at Baylies Street

Baylies Street, as seen in Figure 2.13, functions as the driveway for the Point Gloria Condominiums and is a private roadway. It has two-way access and stop controlled, but has no crosswalk present for pedestrians on the Davol Street West sidewalk.

Davol Street West at Cedar Street U-turn

This U-turn, seen in Figure 2.14, provides access both to and from Davol Street East. No deceleration lane or acceleration lanes are present for the U-turns. There are sidewalks along the U-turns, but no crosswalks are provided. Visibility between the U-turns and Davol Street West is limited due to vegetation. There is limited stopping sight distance along the U-turn roadways due to the berm supporting the elevated Route 79. In addition, no signs are present regarding the U-turn merge.

Figure 2.14: Cedar Street U-turn

2.3.3.2 Intersection Geometry – Davol Street East

Davol Street East has only one signalized intersection throughout its length, which is located at President Avenue. All other intersections with driveways and sidestreets are unsignalized. At each intersection, Davol Street East has two 12-foot wide lanes in the southbound direction and no exclusive turning lanes. Wheelchair ramps are provided along the eastern side of Davol Street West at each intersection, but none of the ramps appear to meet current design and ADA standards. More detailed information is provided in the following section regarding the intersections of Davol Street East with the Cedar Street U-turn, Turner Street, Pearce Street, Brownell Street, the on-ramp from Northbound Route 79, the Cory Street U-turn and Brightman Street. Information for the intersection with President Avenue is provided in a following section titled, *Intersection Geometry – President Avenue*.

Davol Street East at Cedar Street U-turn

The Cedar Street U-turn, seen in Figure 2.14, provides access both to and from Davol Street West. Davol Street East has two through lanes at this location. As in the southbound direction, no deceleration or acceleration lanes are provided along Davol Street East and visibility is limited along the U-turn roadways. No crosswalks are provided for the sidewalks along the U-turn roadways.

Davol Street East at Turner Street

At Turner Street, Davol Street East has two through lanes and no exclusive turning lanes. Turner Street is a two-way roadway that is stop controlled. No crosswalk for pedestrians on the sidewalk is present across Turner Street. See Figure 2.15 for a graphic of this intersection.

Figure 2.15: Davol Street East at Turner Street

Davol Street East at Pearce Street

Pearce Street, seen in Figure 2.16, provides one lane in the westbound direction with parking along each side. It is stop controlled with no crosswalk present at the intersection. Davol Street East has two lanes at this location.

Figure 2.16: Davol Street East at Pearce Street

Davol Street East at Brownell Street

Brownell Street is a two-way roadway with a right-in and right-out only intersection at Davol Street East. Davol Street East has two lanes in the northbound direction and no turning lanes for Brownell Street. At this location, the distance along Brownell Street between Davol Street East and Lindsey Street is very short, approximately 50 feet. As the sidewalk along Davol Street East ends and follows Brownell Street, no crosswalk is necessary at this intersection. See Figure 2.17 for a graphic of this intersection.

Figure 2.17: Davol Street East at Brownell Street

Davol Street East at Northbound Route 79 On-Ramp

The on-ramp from Northbound Route 79 merges with the left of two Davol Street East lanes over approximately 225 feet. There is sufficient sight distance at this location, roughly 300 feet. However, there is a merge sign that is located too close to the merge point to provide sufficient advance notice to drivers. This sign does not apply to any upcoming merging segments. See Figure 2.18 for a graphic of this location.

Figure 2.18: Davol Street East at On-Ramp from Route 79

Davol Street East at Cory Street U-turn

The Cory Street U-turn comes from Davol Street West and forms a third lane along Davol Street East. This third lane becomes an exit-only lane for another U-turn ramp located near Brightman Street that provides access back to Davol Street West. This weaving segment is approximately 900 feet long. As detailed

in Section 2.3.5, Existing Traffic Analysis, this weaving segment operates with an acceptable Level of Service. See Figure 2.19 for a graphic of this location.

Figure 2.19: Davol Street East at Cory Street U-turn

Davol Street East at Brightman Street

Near Brightman Street, Davol Street East carries three lanes, as seen in Figure 2.20. The left lane becomes an exit-only lane to the U-turn to Davol Street West. The other two lanes continue to the north and provide access to U.S. Route 6 and Northbound Route 79. Vehicles from Davol Street East are allowed to turn right onto Brightman Street, but no exclusive turning lane is provided. Brightman Street is a one-way eastbound roadway. Prior to construction of the Veterans Memorial Bridge, Brightman Street was a two-way roadway with full access to Northbound and Southbound Route 79 and Davol Street East via two signalized intersections. Redesign of this area associated with the new bridge construction resulted in eliminating this access and restricting Brightman Street to a one-way eastbound road, away from Route 79. This modification was necessitated by the proximity of the Brightman Street/Davol Street East intersection to the newly constructed U-turn between Davol Street East and Davol Street West. Constraining Brightman Street to one-way operation also forced reversal of McDonald Street and Morton Street. As a result, vehicles previously using Brightman Street for access to Route 79 and Davol Street now use circuitous routes through the neighborhood roadways.

The intersection of Brightman Street with Lindsey Street is 40 feet east of Davol Street East. Lindsey Street is one-way northbound north of Brightman Street. Traffic coming from Davol Street East has a free movement through the intersection with Lindsey Street. Lindsey Street is stop controlled. There are sidewalks along Brightman Street and Lindsey Street, but no crosswalks are provided at the intersection.

Figure 2.20: Davol Street East at Brightman Street U-turn

2.3.3.3 Intersection Geometry – President Avenue

President Avenue intersects many sidestreets and driveways. For this study, only a select number of intersections were included. These intersections are at Davol Street West and Davol Street East, Lindsey Street, North Main Street, Highland Avenue, Robeson Street, Elsbree Street and the rotary with North Eastern Avenue.

President Avenue at Davol Street West

This intersection, seen in Figure 2.21, is controlled by a fully actuated traffic signal with crosswalks and pedestrian signals across all four legs of the intersection. No countdown timers are provided for the exclusive pedestrian phase and while wheelchair ramps are provided at all crosswalks, they do not meet ADA standards. The traffic signal at this intersection provides one phase for each roadway. Davol Street West has two shared lanes that are 11 feet wide at the intersection. No exclusive turning lanes are provided along Davol Street West. Along westbound President Avenue, there are two lanes that are 11 feet wide at the intersection. One is a through lane providing access to Bicentennial Park and the other lane is a through lane that becomes a left-turn only lane onto Davol Street West. The eastbound leg of this intersection provides access to and from Bicentennial Park with one lane in each direction.

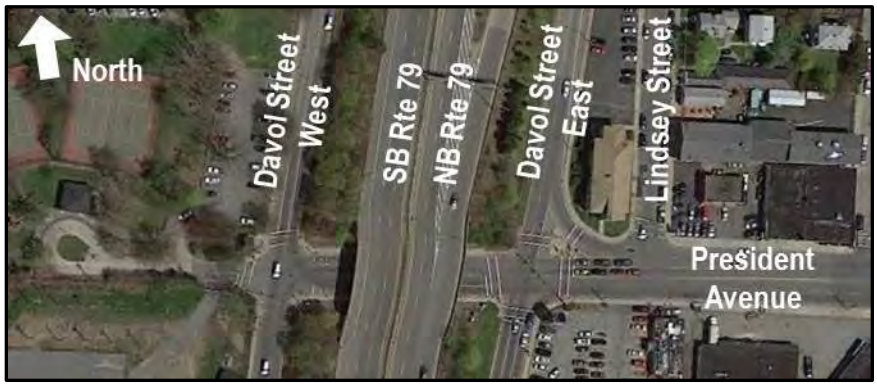


Figure 2.21: President Avenue at Davol Street West and Davol Street East

President Avenue at Davol Street East and Lindsey Street

The intersection with Davol Street East, seen in Figure 2.21, is controlled by a fully actuated traffic signal with crosswalks across all roadways. Pedestrian signals are provided for each crosswalk except the crosswalk across the westbound President Avenue right-turn lane. An exclusive pedestrian phase is provided at the traffic signal and wheelchair ramps are provided at all crosswalks although they do not meet ADA standards. Eastbound President Avenue has an exclusive traffic signal phase allowing through and left turn movement followed by a phase allowing east-west movement along President Avenue with permitted left turns. A yield sign is present along the right-turn lane. Davol Street East has three lanes at the intersection, a shared through and left-turn lane, a through lane, and an exclusive right-turn lane. Along eastbound President Avenue, two shared lanes are present. Along westbound President Avenue, there are three lanes that cross Lindsey Street and approach Davol Street East. These include two through lanes and an exclusive, channelized right-turn lane that yields to Davol Street East traffic. All lanes along President Avenue are 11 feet wide and all lanes along Davol Street East are 12 feet wide.

Lindsey Street is stop controlled at its intersection with President Avenue. There is a crosswalk across Lindsey Street but none across President Avenue. There are no exclusive turning lanes along either roadway.

President Avenue at North Main Street

This intersection, seen in Figure 2.22, is controlled by a fully actuated signal with crosswalks and pedestrian signals across all intersection legs. Radial wheelchair ramps that do not meet ADA standards are provided in each corner of the intersection. Pedestrian signals are provided for all crosswalks but do not provide countdown timers. Pedestrians have an exclusive phase programmed into this intersection's traffic signal. North Main Street provides one lane in each direction with no exclusive turning lanes at the intersection. Eastbound President Avenue has two lanes that become a shared through and right-turn

lane and an exclusive left-turn lane at the intersection. The westbound approach has a shared through and right-turn lane and an exclusive left-turn lane. The traffic signal has only two phases, one for each roadway. All lanes along President Avenue are 12 feet wide. No pavement markings are present along North Main Street to delineate lane widths.

Figure 2.22: President Avenue at North Main Street

President Avenue at Highland Avenue

The intersection of President and Highland Avenues is unsignalized. There are crosswalks across all legs of this intersection, but no pedestrian signals are provided. Non-compliant wheelchair ramps are present in each corner of the intersection. Highland Avenue is a two-way road north of President Avenue and is one-way southbound south of President Avenue. Each roadway has one lane approaching the intersection. Highland Avenue is approximately 40 feet wide and allows parking on each side of the roadway. Travel lanes along President Avenue are roughly 11 feet wide with parking allowed on the north side of the road.

Due to insufficient sight distance along President Avenue, no left turns are allowed onto Highland Avenue. In order to travel southbound on Highland Avenue, westbound President Avenue vehicles must turn left one block earlier at Hanover Street and then make a right turn onto Pearce Street. Left turns are also prohibited from Highland Avenue onto Eastbound President Avenue. In order to turn left and travel east along President Avenue, southbound Highland Avenue motorists must travel one block to the east to Hanover Street where they are able to make a left turn. A flashing yellow light is provided at the intersection for the eastbound and westbound President Avenue approaches as well as the southbound Highland Avenue approach. See Figure 2.23 for a graphic of this intersection.

Figure 2.23: President Avenue at Highland Avenue

President Avenue at Robeson Street

President Avenue at Robeson Street, as seen in Figure 2.24, is controlled by a fully actuated traffic signal with crosswalks and pedestrian signals across each intersection leg. Wheelchair ramps are provided at each crosswalk, but they do not comply with the latest ADA standards. Pedestrians are provided with an exclusive phase at the traffic signal, but the pedestrian signals are not equipped with countdown timers. The traffic signal provides one signal phase for each roadway. One 11-foot wide shared lane is provided on all approaches. No exclusive turning lanes are present.

Figure 2.24: President Avenue at Robeson Street

President Avenue at Elsbree Street

President Avenue's intersection with Elsbree Street is partially signalized. Approaching the intersection with Elsbree Street, eastbound President Avenue is split by a triangular landscaped median approximately 200 feet west of the

intersection to create a channelized, stop-controlled right turn lane onto Southbound Elsbree Street. This channelized lane also provides access to Moore Street, but prevents Moore Street traffic from turning left onto westbound President Avenue or Elsbree Street north of the intersection. In addition, south of the intersection, Elsbree Street is one-way southbound. Traffic on Moore Street must travel west to Charlotte Street or Chestnut Street in order to travel west along President Avenue.

Elsbree Street is a two lane two-way road north of President Avenue. The southbound approach of Elsbree Street consists of a single shared through and right-turn lane and an exclusive left-turn only lane. Each lane is 11 feet wide. The eastbound approach to the signalized intersection provides two through lanes and an exclusive left-turn lane. Along the westbound approach, two through lanes and exclusive right and left-turn lanes are provided at the intersection. All lanes along President Avenue are 11 feet wide. West of the intersection, two westbound through lanes merge into one lane roughly 200 feet after exiting the intersection. At the traffic signal, an exclusive left turn phase is provided along President Avenue followed by a phase allowing through movement along President Avenue. A third phase allows movement along Elsbree Street.

Crosswalks are provided across all intersection legs and pedestrian signals are provided at all signalized intersection legs. Wheelchair ramps are provided at all crosswalks but are not ADA compliant. Pedestrians have an exclusive phase at this traffic signal, but no countdown timers are provided with the pedestrian signals. See Figure 2.25 for a graphic of this intersection.

Figure 2.25: President Avenue at Elsbree Street

President Avenue at North Eastern Avenue Rotary

This rotary has three legs, the President Avenue approach from the west, the North Eastern Avenue approach from the south, and the eastern approach from the Route 24 ramps. The President Avenue approach has one-lane entry and exit. The other two approaches have both two-lane entries and exits. The rotary is approximately 400 feet in diameter and the circulating roadway width within the rotary is roughly 40 feet. No pavement markings are provided within the rotary to delineate travel lanes. All traffic entering the rotary must yield to traffic circulating within the rotary.

A sidewalk is present along eastbound President Avenue and continues along the southbound lanes of North Eastern Avenue. No crosswalks are present at the rotary and no crosswalks are required at the rotary as no sidewalks cross the entrances or exits of the rotary. See Figure 2.26 for a graphic of the rotary.

Figure 2.26: President Avenue at North Eastern Avenue Rotary

2.3.4 Existing Traffic Volumes

Traffic volumes were collected for the Regional Transportation Impact Area in July and November of 2012. Within the Focus Area, the roadway network is comprised of Route 79, Davol Street Northbound and Southbound, President Avenue and several other sidestreets. Automatic traffic recorder (ATR) counts were completed along I-195, Route 24, Route 79, the rotary along President Avenue and along all ramps in order to determine traffic volumes along all freeway segments. Turning Movement Counts (TMCs) were completed at individual intersections along President Avenue, Davol Street West and Davol Street East. The intersections where traffic counts were collected were described in Section 2.3.3, Existing Intersection Geometry.

Traffic volumes and turning movement counts were also collected for I-195, U.S. Route 6, Lee's River Avenue, Brayton Point Road and Brayton Avenue within Somerset and Swansea. This data was collected for use in traffic modeling for alternatives analysis to determine whether traffic would be diverted through Somerset and Swansea.

Existing turning movement counts and traffic volume exhibits are shown in Figures 2.27 through 2.30.

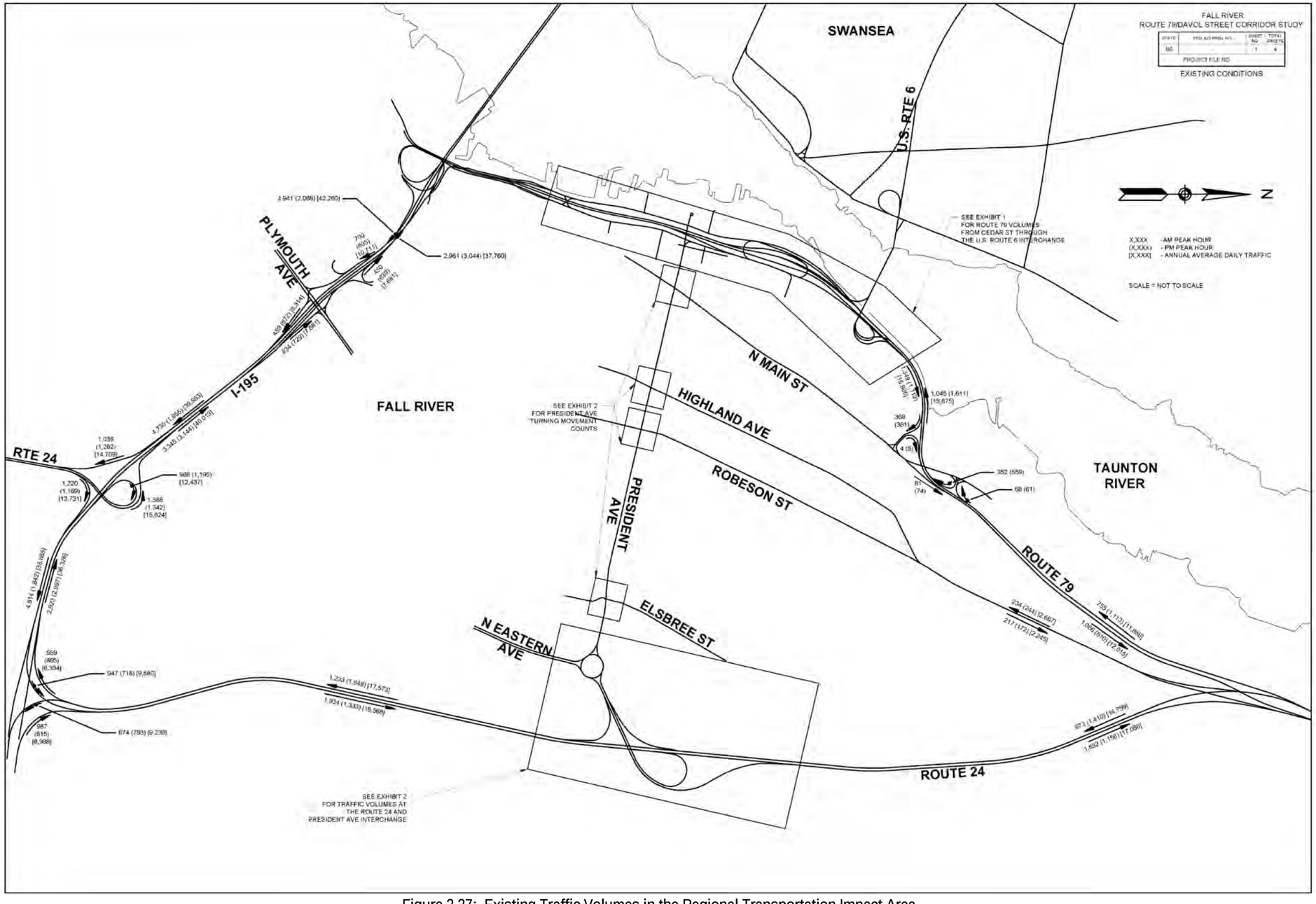


Figure 2.27: Existing Traffic Volumes in the Regional Transportation Impact Area

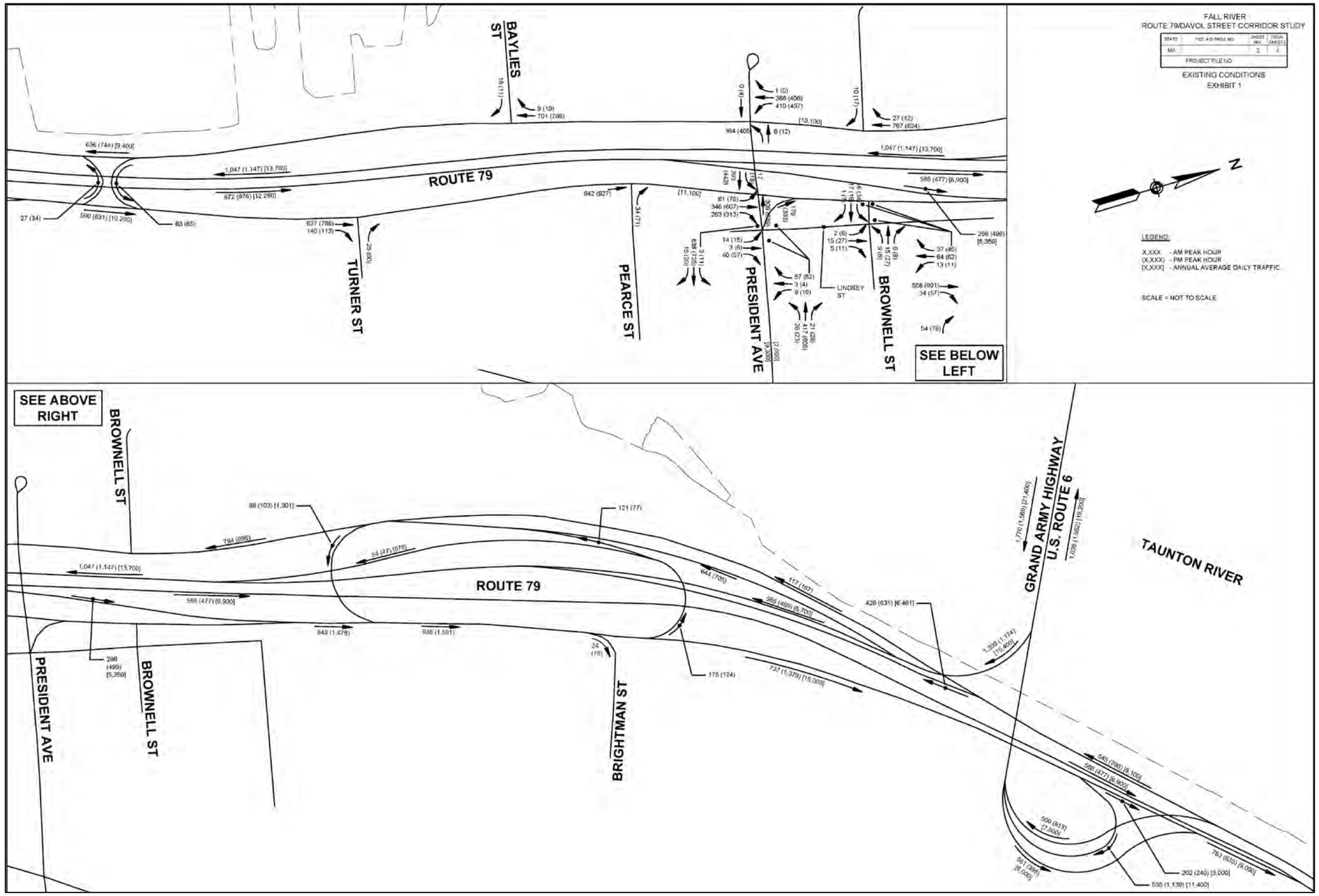


Figure 2.28: Existing Traffic Volumes in the Focus Area

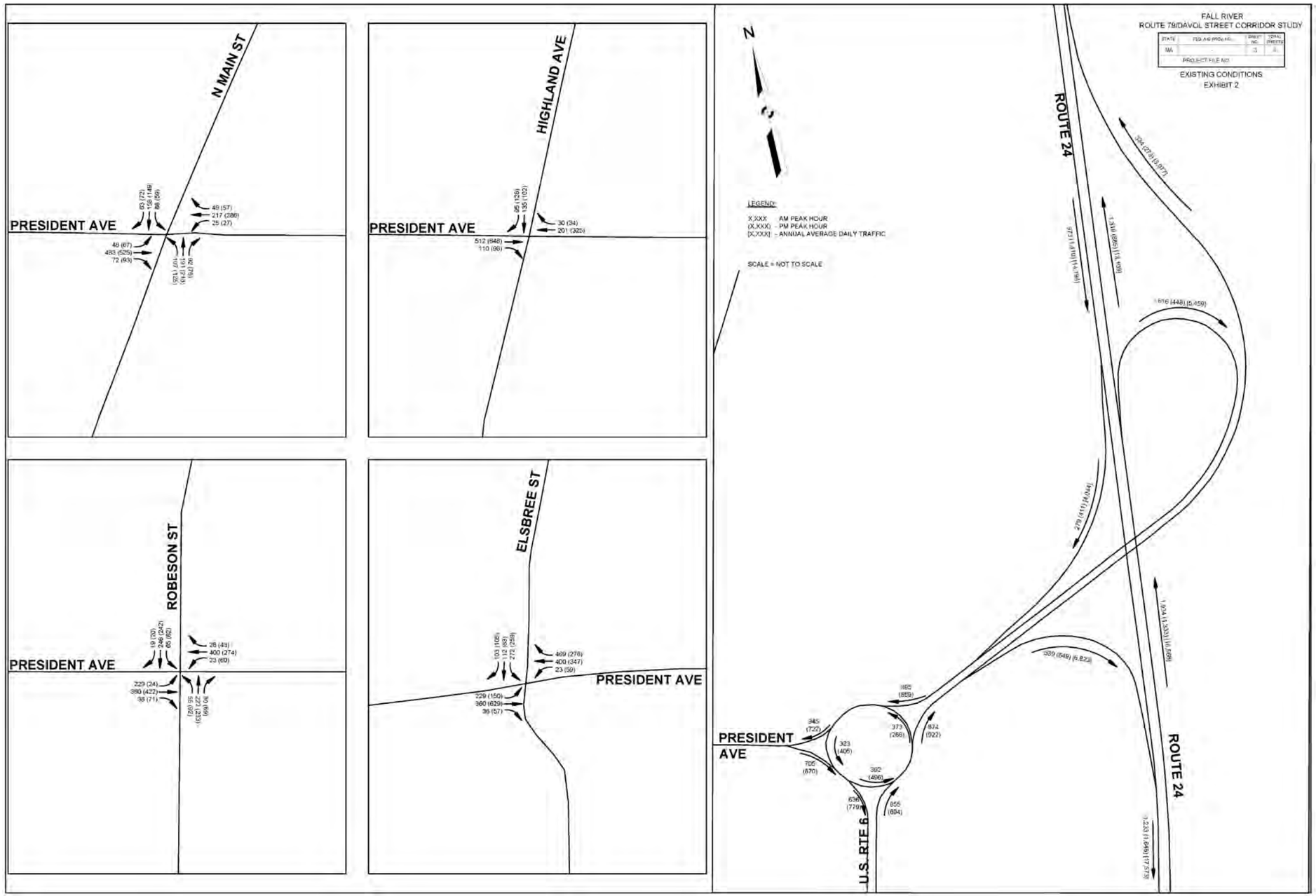


Figure 2.29: Existing Traffic Volumes along President Avenue

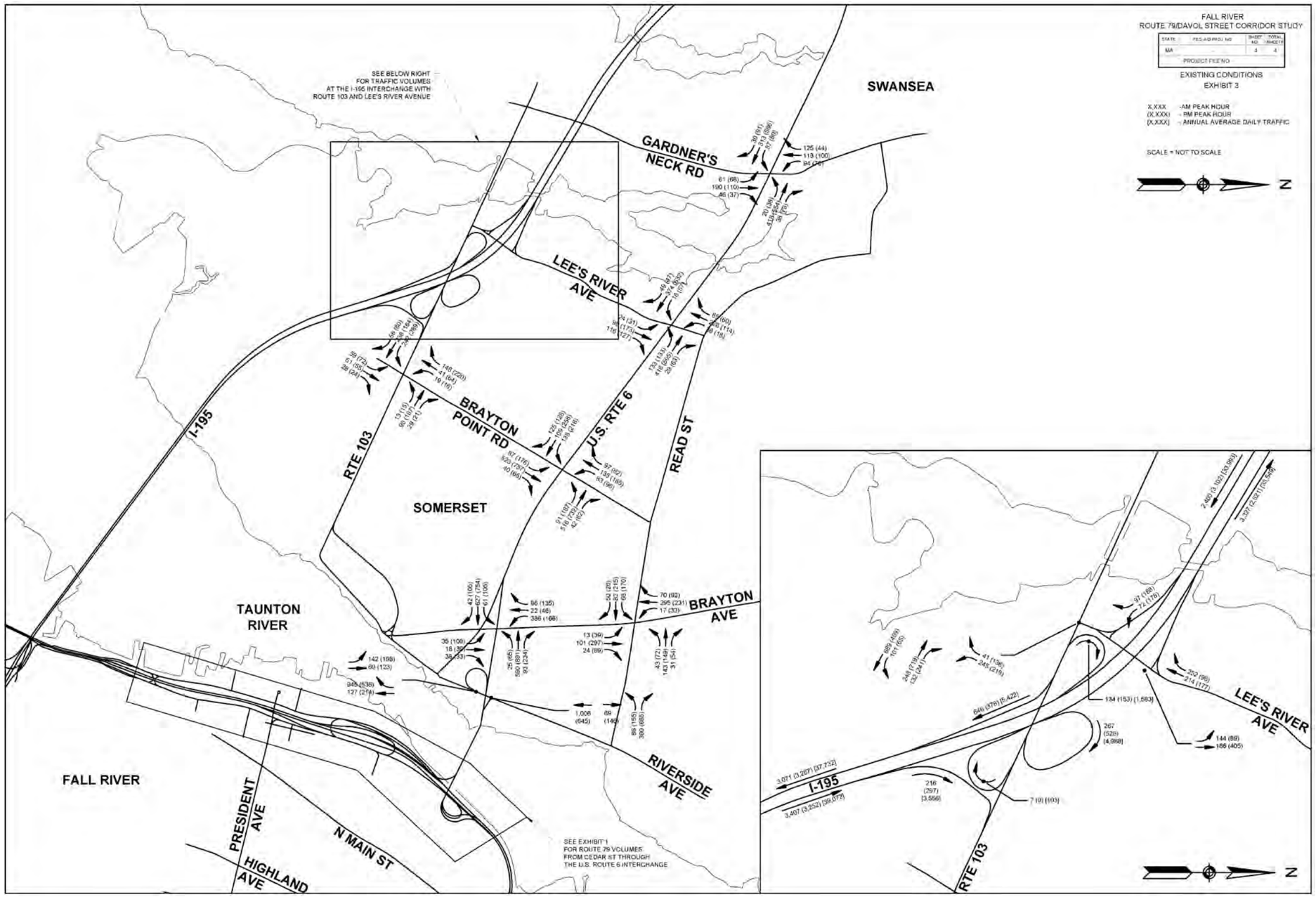


Figure 2.30: Existing Traffic Volumes in Somerset and Swansea

In the Focus Area, traffic volumes are provided for all turning movements along Route 79, Davol Street and all side streets connecting with Davol Street. Volumes are also provided along President Avenue (U.S. Route 6), and at its intersections with Davol Street, Lindsey Street, North Main Street, Highland Avenue, Robeson Street, Elsbree Street and at the rotary just west of the interchange with Route 24.

Within the Regional Transportation Impact Area, I-195 carries an Average Daily Traffic (ADT) volume of approximately 40,000 vehicles in each direction. I-195 is an east-west interstate highway that begins in Providence, Rhode Island and ends in West Wareham, Massachusetts. Route 79, a north-south roadway connecting Route 24 with I-195 along the Taunton River typically has two travel lanes in each direction and carries roughly 15,000 vehicles per day in each direction. Route 24 extends from I-93 in the north to Portsmouth, Rhode Island. It provides two lanes in each direction and carries roughly 17,000 vehicles per day in each direction.

Within the Focus Area, the existing roadway network provides connections between Route 79, U.S. Route 6 and local roadways. U.S. Route 6 spans the Taunton River across the Veterans Memorial Bridge and then follows along President Avenue through Fall River. Along northbound Route 79, roughly 33% of the traffic in the morning and 50% of traffic in the afternoon exit northbound Route 79 to go west on U.S. Route 6 via Davol Street East. As this exit ramp is north of President Avenue, access to eastbound U.S. Route 6 (eastbound President Avenue) is provided via an exit ramp to Davol Street East located south of the Cedar Street U-turn. Along southbound Route 79, roughly half of all vehicles exit Route 79 to continue west along U.S. Route 6. Of the remaining vehicles, about 20% exit to travel south on Davol Street towards eastbound U.S. Route 6. Of the traffic headed westbound on President Avenue, over half of the traffic heads southbound onto Davol Street West towards southbound Route 79. Approximately 25% of traffic going eastbound on U.S. Route 6 continues onto Northbound Route 79. Of the remaining 75% of traffic from Eastbound U.S. Route 6, approximately 40% continue onto Southbound Route 79. The remainder travels southbound on Davol Street towards President Avenue and local streets.

2.3.5 Existing Traffic Analysis

Roadway operating levels of service are calculated following procedures defined in the Highway Capacity Manual (2010), published by the Transportation Research Board. The key performance indicators obtained through the analysis are delay, Level of Service (LOS), volume to capacity ratio, and queue length. LOS is the term used to describe the quality of traffic flow on a roadway facility at a particular point in time. Operating levels of service are reported on a scale of A to F, with LOS A representing free-flow or uncongested conditions with little or no delay to motorists, and LOS F representing a forced-flow condition with long delays and traffic demands exceeding roadway capacity. For intersections, the operating LOS is a function of vehicle delay. For freeway facilities, the operating LOS is a function of density (passenger cars per mile per lane). The LOS is calculated according to the criteria shown in Table 2.9.

Table 2.9: Level of Service Criteria

Level of Service	Intersections Delay per Vehicle, sec. (v/c ≤ 1.0)		Freeway Facilities Density (pc/mi/ln)
	Unsignalized	Signalized	
A	≤ 10.0	≤ 10.0	≤ 11
B	10.1 to 15.0	10.1 to 20.0	> 11 – 18
C	15.1 to 25.0	20.1 to 35.0	> 18 – 26
D	25.1 to 35.0	35.1 to 55.0	> 26 – 35
E	35.1 to 50.0	55.1 to 80.0	> 35 – 45
F	> 50.0	> 80.0	> 45 or v/c > 1

Source: Highway Capacity Manual, Fifth Edition, Transportation Research Board, National Research Council, Washington, DC, 2010.

The existing traffic conditions were analyzed for intersections and freeway facilities within the Regional and Focus Areas using Synchro and Highway Capacity Software. The analysis showed that overall, the freeway facilities and intersections within the Regional and Focus Areas generally operate at LOS C or better.

At the intersection of Lindsey Street with President Avenue, the 95th percentile queues back up along Lindsey Street approximately 170 feet in the AM peak hour and 340 feet in the PM peak hour. The queues along westbound President Avenue for the intersection with Davol Street East are not excessively long during the peak hours, roughly 170 to 220 feet, but they are long enough to block Lindsey Street. At the intersection of North Main Street with President Avenue, queues in the northbound and southbound directions are over 230 feet long (up to 410 feet in the northbound direction during the PM peak hour). This is likely due to the lack of turning lanes and an exclusive turning phase at the intersection. In the eastbound direction along President Avenue, the AM peak hour queue is 350 feet long which extends just past Dyer Street. In the PM peak hour, the queue of vehicles is 500 feet long, extending past the railroad bridge. At the intersection of President Avenue with Robeson Street, queues in all four directions are long as there is a high volume of turning vehicles at the intersection with no exclusive turning lanes or exclusive turning signal phases. In the northbound and southbound directions, the queues do not extend to the next intersection, but in the eastbound and westbound directions, the queues do extend far enough to block neighboring intersections. At the eastbound approach to the President Avenue Rotary, the queue backs up approximately 800 feet in the afternoon peak hour, almost to the intersection with Elsbree Street. No other extensive queuing was seen at intersections within the study area.

I-195 Eastbound sees some congestion in the morning peak hour when it operates with LOS D, but operates much better in the afternoon when the LOS improves to A. U.S. Route 6 sees some operational issues, particularly at Robeson Street and at the President Avenue Rotary. However, these locations are outside of the Focus Area, and were analyzed for the purpose of estimating regional traffic operations and will be used primarily in the alternatives analysis

Traffic operations data for freeway segments, weaving segments and ramp segments within the Regional Transportation Impact Area are provided in Tables 2.10 through 2.12. Traffic operations data for all intersections studied are provided in Table 2.13. It should be noted that traffic counts were collected prior to the opening of Morton Middle School, located at the intersection of President Avenue and North Main Street. The school opened in the fall of 2013.

Table 2.10: Existing Conditions (2012) along all Freeway Segments

FREEWAY SEGMENTS	AM Peak Hour		PM Peak Hour	
	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Route 24 - Northbound				
North of I-195	B	15.1	A	10.4
North of President Avenue Off-Ramp	A	10.3	A	6.9
North of President Avenue On-Ramp	B	12.9	A	9.0
North of Highland Avenue	B	14.6	A	10.4
North of Route 79	C	23.5	B	16.7
Route 24 - Southbound				
North of Route 79	B	15.3	C	21.9
South of Route 79	A	9.4	B	12.9
South of Highland Avenue	A	7.6	A	11.0
South of President Avenue Off-Ramp	A	5.4	A	7.8
South of President Avenue On-Ramp	A	9.6	B	12.8
I-195 - Eastbound				
West of Plymouth Avenue Off-Ramp	D	27.3	A	10.8
Between Plymouth Avenue Ramps	C	22.4	A	6.7
East of Plymouth Avenue On-Ramp	C	25.7	A	10.2
East of SB Route 24 Off-Ramp	C	19.3	A	3.5
East of NB Route 24 On-Ramp	D	27.1	A	9.6
East of NB Route 24 Off-Ramp	C	20.8	A	5.8
East of SB Route 24 On-Ramp	C	24.9	A	9.9
I-195 - Westbound				
East of NB Route 24 Off-Ramp	B	17.4	B	14.3
West of NB Route 24 Off-Ramp	B	12.3	B	11.1
West of SB Route 24 On-Ramp	B	15.2	B	15.6
West of SB Route 24 Off-Ramp	A	10.2	A	9.4
West of NB Route 24 On-Ramp	B	17.4	B	16.3
Between Plymouth Avenue Ramps	B	13.0	B	12.5
West of Plymouth Avenue On-Ramp	B	15.4	B	12.5

Table 2.10: Existing Conditions (2012) along all Freeway Segments (Continued)

FREEWAY SEGMENTS	AM Peak Hour		PM Peak Hour	
	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Route 79 - Northbound				
South of Davol Street Off-Ramp	A	6.8	A	7.6
North of Davol Street Off-Ramp	A	4.6	A	3.7
North of North Main Street Off-Ramp	A	7.6	A	5.7
North of SB North Main Street On-Ramp	A	8.3	A	5.7
South of Route 24	A	8.3	A	6.3
Route 79 - Southbound				
South of Route 24	A	5.9	A	8.7
South of North Main Street Off-Ramp	A	5.4	A	8.2
South of North Main Street On-Ramp	B	12.5	A	8.1
South of U.S. Route 6 Off-Ramp	A	4.2	A	4.2
South of Davol Street Off-Ramp	A	3.3	A	4.9
South of U.S. Route 6 On-Ramp	A	7.7	A	8.6
South of Davol Street On-Ramp	A	8.2	A	8.9

Table 2.11: Existing Conditions (2012) along all Weaving Segments

WEAVING SEGMENTS	AM Peak Hour			PM Peak Hour		
	LOS	v/c	Density (pc/mi/ln)	LOS	v/c	Density (pc/mi/ln)
NB Route 79 between U.S. Route 6 frontage road and North Main Street Off-Ramp	A	0.33	8.8	A	0.27	7.1
Davol Street East between Cory Street U-turn and Brightman Street U-Turn	A	0.18	8.4	B	0.29	14.5
Davol Street West between Brightman Street U-turn and Cory Street U-turn	B	0.35	14.7	B	0.37	15.8

Table 2.12: Existing Conditions (2012) along all Ramp Segments

RAMP LOCATIONS	AM Peak Hour		PM Peak Hour	
	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Route 24 & Route 79				
SB Route 24 Off-Ramp to Route 79	B	19.6	C	27.3
SB Route 24 Off-Ramp to Highland Avenue	B	12.5	B	16.8
NB Route 24 On-Ramp from Highland Avenue	B	19.3	B	14.7
NB Route 24 On-Ramp from Route 79	C	27.5	C	20.8
Route 24 & U.S. Route 6 (President Avenue)				
SB Route 24 Off-Ramp to U.S. Route 6	A	1.2	A	5.4
SB Route 24 On-Ramp from U.S. Route 6	B	10.2	B	13.8
NB Route 24 Off-Ramp to U.S. Route 6	B	12.7	A	8.5
NB Route 24 On-Ramp from U.S. Route 6	B	13.4	A	7.6
Route 24 & I-195 (North of I-195)				
WB I-195 Off-Ramp to Route 24 NB	C	24.9	C	20.7
WB I-195 On-Ramp from Route 24 SB	B	17.5	B	18.8
EB I-195 Off-Ramp to Route 24 NB	D	32.0	B	15.3
EB I-195 On-Ramp from Route 24 SB	C	22.8	A	8.5
Route 24 & I-195 (South of I-195)				
WB I-195 Off-Ramp to Route 24 SB	C	21.7	C	22.8
WB I-195 On-Ramp from Route 24 NB	C	24.2	C	23.0
EB I-195 Off-Ramp to Route 24 SB	D	28.6	B	14.8
EB I-195 On-Ramp from Route 24 NB	D	30.3	B	14.3
I-195 & Plymouth Avenue				
WB I-195 Off-Ramp to Plymouth Avenue	C	22.2	C	20.8
WB I-195 On-Ramp from Plymouth Avenue	B	18.3	B	19.3
EB I-195 Off-Ramp to Plymouth Avenue	D	29.3	B	14.6
EB I-195 On-Ramp from Plymouth Avenue	C	27.7	B	14.0
Route 79 & Main Street				
SB Route 79 Off-Ramp to Main Street	A	6.7	B	10.1
SB Route 79 On-Ramp from Main Street	A	8.0	B	12.9
NB Route 79 On-Ramp from SB Main Street	B	10.9	A	8.7
NB Route 79 On-Ramp from NB Main Street	B	11.8	A	9.5
Route 79 & Route 6				
SB Route 79 Off-Ramp to U.S. Route 6	B	11.4	B	16.8
SB Route 79 Off-ramp to Davol Street West	A	7.1	A	9.5
SB Route 79 On-Ramp from U.S. Route 6	B	11.1	B	12.0
SB Route 79 On-Ramp from Davol Street East	A	3.5	A	4.4
NB Route 79 Off-Ramp to Davol Street East	A	5.7	A	6.7

Table 2.13: Existing Conditions (2012) at all Intersections

Location	AM Peak Hour					PM Peak Hour				
	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue
Davol Street East at Turner Street	A	0.4				A	0.9			
NB Through/Right	A	0.0	0.27	0	4	A	0.0	0.30	0	0
WB Right	B	11.5	0.05	20	48	B	13.3	0.15	31	61
Davol Street East at Pearce Street	A	0.5				A	0.8			
NB Through/Right	A	0.0	0.21	0	4	A	0.0	0.34	1	17
WB Right	B	10.9	0.06	20	43	B	12.8	0.12	33	59
Davol Street East at President Avenue	B	18.3	0.56			B	19.7	0.61		
NB Left/Through	B	19.5	0.57	79	128	C	21.9	0.75	142	233
NB Right	C	33.7	0.82	125	215	C	26.0	0.76	147	242
EB Left/Through	A	8.1	0.28	61	122	B	10.6	0.34	70	141
WB Through	B	18.3	0.46	91	112	C	21.7	0.55	94	109
WB Right	B	16.6	0.13	1	14	B	19.8	0.24	30	97
Davol Street East at Brownell Street	A	1.0				A	1.0			
NB Through/Right	A	0.0	0.22	3	63	A	0.0	0.38	5	72
WB Right	B	10.6	0.08	28	50	B	13.7	0.17	34	54
Davol Street West at Brownell Street	A	0.1				A	0.2			
SB Through/Right	A	0.0	0.33	1	12	A	0.0	0.36	1	14
EB Right	B	11.4	0.02	8	28	B	11.8	0.03	13	36
Davol Street West at President Avenue	B	18.6	0.72			C	21.8	0.76		
SB Left/Through/Right	B	17.4	0.69	163	253	C	20.9	0.74	177	274
EB Through/Right	A	0.0	0.00	0	0	B	11.5	0.01	3	19
WB Through	B	10.8	0.01	4	22	B	11.6	0.02	8	31
WB Left	C	21.3	0.75	133	214	C	24.0	0.78	156	233
Davol Street West at Baylies Street	A	0.3				A	0.2			
SB Through/Right	A	0.0	0.30	0	0	A	0.0	0.34	0	0
EB Right	B	11.1	0.03	14	40	B	11.6	0.02	8	30
Lindsey Street at Brownell Street	A	7.6				A	7.5			
NB Left/Through/Right	A	9.5	0.03	16	41	A	10.0	0.06	20	46
SB Left/Through/Right	A	9.9	0.14	36	57	B	10.2	0.16	53	124
EB Left/Through/Right	A	3.5	0.01	1	9	A	4.5	0.02	4	24
WB Left/Through/Right	A	2.2	0.01	0	4	A	1.1	0.00	1	12

Table 2.13: Existing Conditions (2012) at all Intersections (Continued)

Location	AM Peak Hour					PM Peak Hour				
	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue
Lindsey Street at President Avenue	A	1.6				A	2.0			
NB Left/Through/Right	B	14.8	0.14	35	70	C	17.9	0.23	50	83
SB Left/Through/Right	B	12.2	0.13	62	168	C	18.7	0.23	146	341
EB Left/Through/Right	A	0.1	0.21	4	26	A	0.4	0.24	10	47
WB Left/Through/Right	A	2.1	0.13	83	171	A	1.5	0.19	126	218
President Avenue at North Main Street	C	22.4	0.79			C	27.2	0.83		
NB Left/Through/Right	C	24.7	0.75	158	271	C	33.3	0.81	236	414
SB Left/Through/Right	B	19.8	0.62	127	238	C	21.3	0.49	134	237
EB Left	B	13.8	0.14	32	125	B	16.6	0.22	78	306
EB Through/Right	C	26.6	0.82	211	347	C	31.9	0.85	283	501
WB Left	B	14.8	0.20	16	42	B	17.9	0.26	18	58
WB Through/Right	B	15.6	0.39	92	168	B	19.0	0.47	135	241
President Avenue at Highland Avenue	A	6.7				B	8.3			
SB Left/Through/Right	D	31.5	0.66	71	124	E	48.3	0.79	75	139
EB Left/Through/Right	A	0.0	0.40	10	58	A	0.0	0.48	3	20
WB Left/Through/Right	A	0.0	0.15	0	0	A	0.0	0.23	0	3
President Avenue at Robeson Street	C	32.1	0.84			B	16.2	0.68		
NB Left/Through/Right	D	48.0	0.81	292	411	B	17.2	0.66	160	279
SB Left/Through/Right	D	50.0	0.82	261	318	B	15.4	0.58	151	258
EB Left/Through/Right	C	27.6	0.85	494	770	B	17.2	0.70	226	437
WB Left/Through/Right	B	12.7	0.41	158	275	B	14.7	0.58	245	462
President Avenue at Elsbree Street	C	20.4	0.64			B	17.3	0.70		
SB Left	C	29.8	0.77	114	196	C	21.6	0.69	96	161
SB Through/Right	C	20.2	0.47	70	129	B	15.7	0.33	54	101
EB Left	C	29.8	0.73	89	154	C	29.2	0.70	65	123
EB Through/Right	A	9.9	0.27	54	91	B	15.3	0.65	91	145
WB Left	F	103.2	0.78	14	38	C	24.9	0.49	31	60
WB Through	B	17.9	0.46	90	148	B	14.9	0.40	62	99
WB Right	B	17.2	0.32	87	152	B	14.0	0.19	53	96
President Avenue Rotary	C	16.8				F	52.9			
NB Left	A	7.6	0.32	N/A	35	A	6.5	0.21	N/A	20
NB Right	C	18.0	0.73	N/A	168	C	16.8	0.69	N/A	145
EB Through/Right	C	24.4	0.84	N/A	250	F	129.3	1.22	N/A	805
WB Left	A	4.4	0.00	N/A	0	A	3.9	0.00	N/A	0
WB Through	B	10.5	0.47	N/A	63	A	7.7	0.34	N/A	38

2.3.6 Safety

Existing Crash Data was obtained from MassDOT for the Focus Area from 2008 to 2010. Crash rates, the number of collisions per one million vehicles entering the intersection, were determined for each intersection shown in Table 2.14. For District 5 the Signalized Intersection Average Crash Rate is 0.77 and the Unsignalized Intersection Average Crash Rate is 0.60. The Statewide Signalized Intersection Average Crash Rate is 0.81 and the Statewide Unsignalized Intersection Average Crash Rate is 0.61.

Table 2.14: 2008 – 2010 Crash Data within Focus Area

Location	Signalized	Year			3 – Year		Crash Rate	Higher than	
		2008	2009	2010	Total	Avg.		State	Dist. 5
Southbound Davol at Brownell Street	No	0	2	0	2	0.67	0.18		
Southbound Davol at President Avenue	Yes	2	7	0	9	3.0	0.54		
Southbound Davol at Baylies Avenue	No	1	1	1	3	1.0	0.28		
Southbound Davol at U-turn from Northbound Davol	No	3	6	1	10	3.33	1.0	X	X
Northbound Davol at U-turn from Southbound Davol	No	7	1	6	14	4.67	1.21	X	X
Northbound Davol at Turner Street	No	3	2	1	6	2.0	0.48		
Northbound Davol at President Avenue	Yes	16	10	22	48	16.0	1.75	X	X
President Avenue at Lindsey Street	No	8	4	4	16	5.33	0.84	X	X
President Avenue at North Main Street	Yes	13	15	17	45	15.0	2.0	X	X
Lindsey Street at Brownell Street	No	3	2	2	7	2.33	2.09	X	X

There are four intersections within the Focus Area that have a crash rate lower than both the Statewide and District 5 averages. These intersections are Davol Street West at Brownell Street, President Avenue and Baylies Avenue and Davol Street East at Turner Street. All other intersections within the Focus Area have a crash rate higher than both the Statewide and District 5 averages. Intersection Crash Rate Worksheets and more detailed summaries of the crash data can be found in the Appendix.

At the U-turn with Davol Street East and Davol Street West, the crash types were a mix of sideswipes, rear end, angle and fixed object collisions. These crashes are likely due to speeds that are too high and poor visibility between oncoming traffic and traffic that is ahead along the U-turn path.

Along President Avenue, a four-lane road with parking along the westbound direction, the intersections with Northbound Davol and Lindsey Street are less than 150 feet apart. Vehicles on Lindsey Street turning onto westbound or eastbound President Avenue must cross through the queue of vehicles at the Davol Street intersection or wait for a gap between vehicles approaching and exiting the Davol Street intersection. The vast majority of crashes at these intersections are rear-end and angle collisions, likely caused by congestion at the intersections and poor visibility of oncoming traffic due to stopped traffic and parked vehicles. There have also been three crashes involving pedestrians at these intersections, two of them at the Lindsey Street intersection. In order to cross President Avenue, pedestrians must use the Davol Street intersection, where pedestrians must cross the westbound President Avenue right-turn lane which does not have a pedestrian signal associated with it.

At the intersection of North Main Street and President Avenue, exclusive left-turn lanes are provided along President Avenue but no protected signal phase is provided. Along North Main Street, northbound and southbound traffic operate at the same time with no protected phases. Of 45 crashes over three years, 21 were angle collisions and 17 were rear-end collisions. Most of the angle collisions involved eastbound traffic turning left onto North Main Street. Most of the rear end collisions were along North Main Street, which is one lane in each direction with no exclusive turn lanes. The causes of these crashes are likely due to lack of an exclusive turning phase and turning lanes.

At the intersection of Lindsey Street with Brownell Street, only Lindsey Street is stop-controlled. Brownell Street has a free-flowing east-west movement traveling to and from Davol Street East. Of the seven crashes at this intersection over three years, five were angle collisions between vehicles on Brownell Street and southbound Lindsey Street traffic. These crashes could be caused by Lindsey Street traffic expecting vehicles on Brownell Street to stop.

2.3.7 Multi-Modal Transportation

Multi-modal transportation is provided throughout the Regional Transportation Impact Area and Focus Area by means of sidewalks, bike paths, bicycle access on local roadways, and bus routes. However, there are gaps and missing links in the network that have been identified in the following section as part of the existing conditions assessment and identification of issues.

2.3.7.1 Walking Conditions

The Route 79 and Davol Street corridor creates a barrier that makes it difficult for pedestrians to access the waterfront. There are only two east-west pedestrian

accessible connections across the Route 79 corridor between Fall River and the waterfront. One is located near I-195 at Central Street and provides access to Heritage State Park. The next crossing is roughly one mile to the north at President Avenue.

There are sidewalks along much of Davol Street, including at the Cedar Street U-turn. However, as shown in Figure 2.31, there are no crosswalks, signals or ramps at this location. In addition, there are two travel lanes on each side of Davol Street. For these reasons, this location is not a safe or legal crossing location for pedestrians. As discussed previously in the section on safety, the Cedar Street U-turn has a high rate of traffic collisions. The next location where pedestrians are able to cross under Route 79, and the only legal pedestrian crossing within the Focus Area, is roughly one mile away at President Avenue. This leaves a large number of residential blocks that are adjacent to the waterfront but not within easy walking distance. The infrequent east-west pedestrian crossings may encourage local residents to drive to the waterfront, rather than walk.

Figure 2.31: Cedar Street U-turn Under Route 79

There is a sidewalk on at least one side of most streets in the study area, as shown in pink on Figure 2.32. There is also a wooden boardwalk along the waterfront shown in blue in Figure 2.32, which starts at Fall River Heritage State Park and continues for 1/2 mile to the north. At this point is becomes a paved path, shown in yellow in Figure 2.32, which connects to and through Bicentennial Park. There are currently no accommodations to walk further north along the waterfront.

Figure 2.32: Sidewalks and Paths in the Project Area

At President Avenue there are crosswalks, ramps, and pedestrian signals as seen in Figure 2.33. However, the sidewalk underneath the elevated roadway is five feet wide and unlit as seen in Figure 2.34.

Figure 2.33: President Avenue Crossing Under Route 79

Figure 2.34: Detail of Sidewalks Along President Avenue Under Route 79

2.3.7.2 Bicycling Conditions

Many Fall River streets are generally suitable for bicycling given typically slow urban traffic speeds on narrow rights-of-way with on-street parking and frequent traffic signals. Bicyclists are prohibited from limited-access highways including I-195, Route 79 and

Route 24, but may use Davol Street and all other local streets. The steep grades in various locations in Fall River can make bicycling challenging, both in terms of the strength needed to ascend and skills needed to safely descend.

By state law, bicyclists may not ride on sidewalks in a business district, but can otherwise bicycle on sidewalks, provided they yield to pedestrians. Local governments are permitted to further restrict sidewalk bicycling, but Fall River has not adopted any restrictions. Although it is currently used by bicyclists, the Department of Conservation and Recreation (DCR) prohibits bicycling on the boardwalk that begins at Fall River Heritage State Park because the boardwalk does not meet bicycling design standards, including alignment and width deficiencies. There are multiple locations along the path where 90-degree turns are required and the path is not wide enough to provide sufficient clear distance between bicyclists and railings.

The previous Brightman Street Bridge was replaced in September 2011 by the Veterans Memorial Bridge, located 1/2 mile upstream of the old bridge. The new bridge has a separated bike path on the north side. On the Somerset side, there is a signalized crosswalk connecting to another section of the path that continues to Brayton Avenue. On the Fall River side, the path makes a 270° loop to cross underneath the bridge along the northbound lanes of Route 79, ending at Wellington Street (see Figure 2.35). The ramp connects with the street system at the dead end of Wellington Street. The City has provided signs for an on-street bike route between Wellington Street and President Avenue via Fulton Street and Lindsey Street. Once at President Avenue, the bike route does not connect to any other bike routes, requiring bicyclists to ride in the roadway or dismount and walk with their bike along the sidewalk.

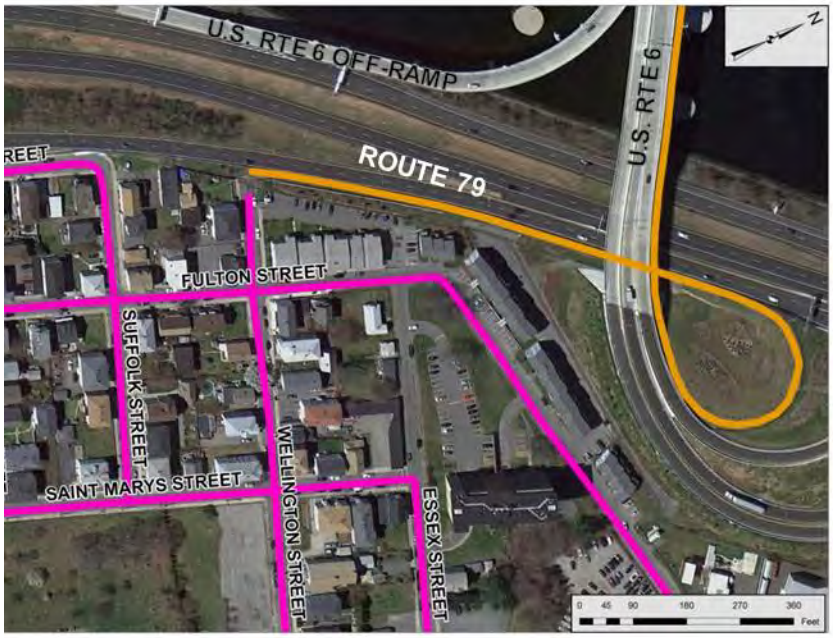


Figure 2.35: Access Ramp for Bicycle and Pedestrian Path on Veterans Memorial Bridge

2.3.7.3 Transit

Local transit service in the Fall River area is provided by the Southeastern Regional Transit Authority (SRTA). The SRTA Fall River Bus Terminal is located on Borden Street between Fourth and Fifth. The Fall River terminal is served by all of the 12 SRTA Fall River routes. Two of these routes operate in the vicinity of the project area:

- Route 2: Operates between the downtown bus terminal and North Fall River, mostly on North Main Street. The route is shown in yellow on Figure 2.10, with its stops shown in red.
- Route 14: Shown in pink on Figure 6, operates between the downtown bus terminal and the Swansea Mall, via the Braga Bridge.

In 2012 a stop was added on Route 2 to serve Commonwealth Landing. In order to serve this stop, buses in both directions must turn off of North Main Street on to President Avenue, travel north on Davol Street to the U-turn north of Brightman Street, stop at 1080 Davol Street, then return via Davol Street and President Avenue, as shown in Figure 2.36. This single stop adds 1.4 miles and approximately five minutes of travel time to Route 2 in each direction. SRTA has considered serving this stop with Route 14, which formerly crossed the Taunton River on the Brightman Street Bridge (now replaced by the Veterans Memorial Bridge). However, Route 14 has hourly service and SRTA believes that it is important to provide service every 30 minutes to Commonwealth Landing. Reconfiguring these routes is possible, particularly if changes to Route 79 and Davol Street facilitate bus travel from downtown to Somerset via the Veterans Memorial Bridge while being able to make local stops.

As of Monday, April 22, 2013, service was extended beyond 6 PM on weekend evenings on Routes 2 and 14, resulting in the following operating plan:

- Route 2: Weekdays, 6:00 AM to 8:30 PM, every 30 min. Saturdays, 7:00 AM to 6:00 PM, every 60 min. No Sunday service.
- Route 14: Weekdays, 8:30 AM to 9:00 PM, every 60 min. Saturdays, 8:30 AM to 6:00 PM, every 60 min. No Sunday service.

Figure 2.36: SRTA Bus Routes 2 and 14

2.4 Future No-Build Conditions

Future No-Build Conditions were developed for the Regional Transportation Impact Area and the Focus Area for the year 2035. The overall purpose and need for this step in the study process is to ensure that any developed and analyzed alternatives will function effectively in the future. It is also intended to identify any traffic operations issues that may not be present under the existing conditions, but given any growth or trip distribution changes may result as an issue in the near, mid, or long-term timeframe.

This step is accomplished by utilizing a travel demand forecasting model to project traffic volumes for the year of 2035 and is discussed in more detail below in the section on CTPS Demand Modeling. The Future No-Build analysis assumes that no infrastructural modifications beyond currently planned projects are completed within the study area. Additionally, economic development changes that are anticipated regionally and within the study area are also included. Specifically, the development of South Coast Rail, the Regatta Club, Marina at City Pier, Commonwealth Landing Mill, and a restaurant on Remington Avenue. The Future No-Build Conditions also includes completion of the I-195/Route 79 Interchange Project.

2.5 Future No-Build Land Use and Environmental Conditions

The Future No-Build Conditions assumed no changes to the existing local roadways, intersections and ramps in the project area. Consequently, it is assumed that there would be no adverse effects on natural or cultural environmental resources in or near the project study area. However, if planned developments within the project Focus Area do come to fruition there may be some impacts to traffic operations which could in turn affect quality of life (socioeconomic environmental resources) for those accessing the area.

2.6 Future No-Build Economic Conditions and Analysis

Within the regional area of Fall River, Somerset and Swansea, as well as statewide, there is expected to be an increase in population, households and jobs between 2010 and 2035. The regional growth in these categories is anticipated to outpace the statewide growth. Table 2.15 provides the Future No-Build anticipated background growth for the region and for the state.

Table 2.15: Future No-Build – 2035 Background Growth

Category	Regional % Change	Statewide % Change
Population	15%	8%
Households	19%	13%
Jobs	14%	8%

Regional data includes Fall River, Somerset and Swansea

Within the Focus Area, the Future No-Build Scenario includes the following planned developments:

- Redevelopment of first three floors of the Commonwealth Landing Mill, which began in 2011, to retail, office, and entertainment space. When it is completed, the Mill is expected to house some 650 new jobs on the Riverfront.
- Conversion of the upper two floors of Commonwealth Landing Mill to 56 new one-to-three-bedroom apartment units. Construction is expected to start in the spring of 2014.
- The planned redevelopment of the Regatta Club as a restaurant.
- The development of City Pier as a marina that is planned by the City of Fall River.

The location of these developments is illustrated in Figure 2.37. Trips that are forecast to be generated by these developments have been included in projections for the Future No-Build Conditions.

Figure 2.37: Proposed Developments along the Waterfront

2.6.1 Travel Demand Modeling

The travel demand model of the Central Transportation Planning Staff (CTPS) of the Boston Metropolitan Planning Organization was used to allocate the impacts of planned developments on the distribution of population and jobs within the study area under the No Build Scenario. While Fall River is located in the Southeastern Massachusetts Metropolitan Planning Organization's region, CTPS has been performing travel demand modeling activities for the South Coast Rail project, so it was deemed beneficial to use the CTPS model for the Route 79 / Davol Street Corridor Study.

This model follows the four step travel-modeling process of trip generation, trip distribution, mode choice, and trip assignment to estimate present and future daily transit ridership and daily highway traffic volumes, primarily on the basis of demographics and the characteristics of the transportation network. One of the key travel demand inputs is land use information, a process call trip generation.

All calculations are performed at the Transportation Analysis Zone (TAZ) level. The TAZ is a unit of geography the model uses to produce and attract person trips. The TAZ is similar in size to Census block groups, but may not always match them precisely, since they were developed with a transportation focus. Figure 2.38, identifies the number and boundaries of the TAZ's used in the Fall River area.

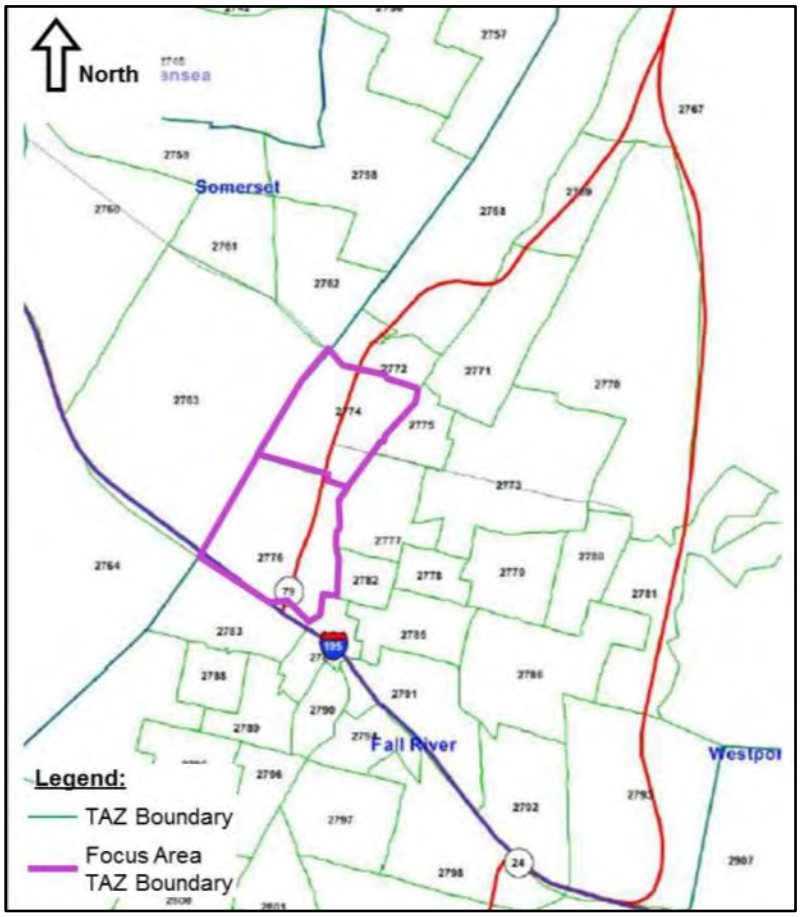


Figure 2.38: Transportation Analysis Zones within the Study Area

As shown in Figure 2.38, the Focus Area is defined by two distinct TAZs (No. 2774 and No. 2776). They are bounded on the east and west by North Main Street and the Taunton River, respectively, and are bounded on the north and south by Brightman Street and I-195, respectively. Baylies Street, an east-west roadway, divides TAZ 2774 to the north from TAZ 2776 to the south.

In order to measure the impacts of specific planned developments on vehicle and transit trips in the Focus Area, TAZ 2774 and TAZ 2776 were divided into subzones, as seen in Figure 2.39. Each TAZ was further divided based on their likely transportation usage in order to refine the analysis of the travel demand model within the Focus Area. Route 79 splits the riverfront area from the rest of Fall River. The only local access that crosses Route 79 is provided via President Avenue and at the U-turn south of Baylies Street.

For the Future No-Build Condition, CTPS utilized the travel demand model developed for the South Coast Rail project. Refinements were made for recent transportation projects and all transportation projects included in the Long Range Transportation Plans of the Boston region Metropolitan Planning Organization and the Southeastern Regional Planning and Economic Development District. The demographics within the No-Build model are based on officially adopted transportation plans as well as anticipated developments (residential and commercial) that are currently planned.

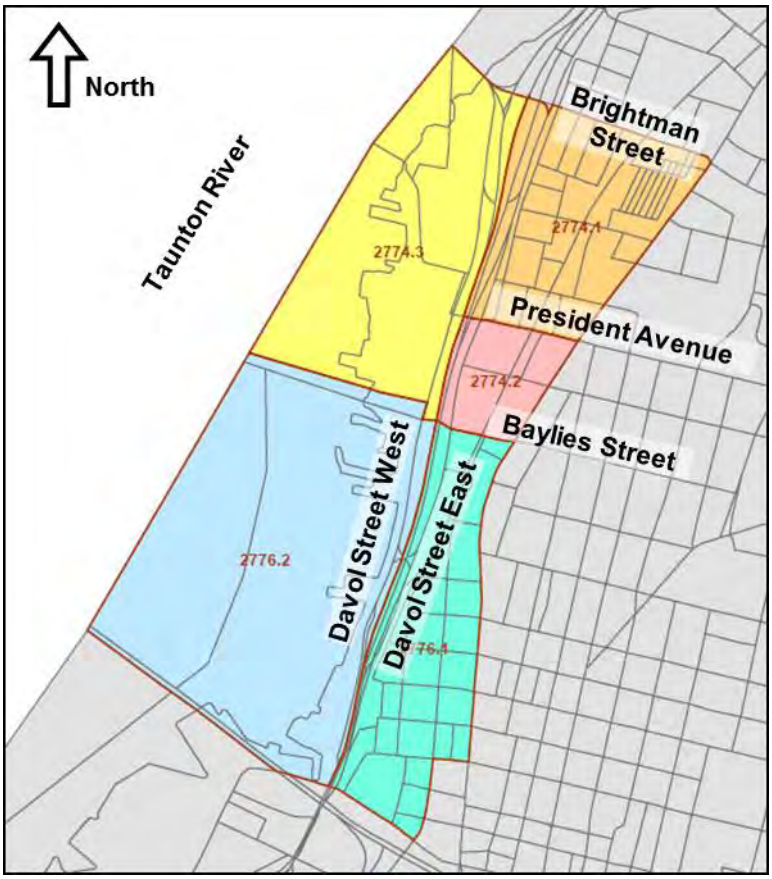


Figure 2.39: Split Transportation Analysis Zones within the Focus Area

Based on Cambridge Economic Research's land use survey fieldwork, CTPS's allocation of 2010 data among the study area TAZ subzones was confirmed as representative of ground data. In allocating 2035 growth to the subzones, all development projects built since 2010 as well as those that are currently planned were included. Table 2.16 shows how the data on population and households have been allocated among the TAZ subzones.

Table 2.16: Estimates and Forecasts of Population and Households within TAZ 2774 and 2776

TAZ	2010		2035	
	Population	Households	Population	Households
2774				
2774.1	1,343	601	1,448	668
2774.2	127	53	127	56
2774.3	43	16	160	71
Total TAZ 2774	1,513	670	1,735	795
2776				
2776.1	1,605	605	1,834	719
2776.2	156	116	178	138
Total TAZ 2776	1,761	721	2,012	857

Source: CTPS and Cambridge Economic Research

For projecting the year 2035 population distribution, all projects currently planned and under construction in the study area have been included. The conversion of the upper two floors of the Commonwealth Landing Mill will result in population growth in TAZ 2774.3. An average of two people per household was assumed. The new apartments will affect the distribution of population in the three TAZ sub-zones in the north of the Study Area. In TAZ 2774.3, which includes the North Riverfront, the proportion of population is expected to increase from 3% in 2010 to 9% in 2013. No changes are expected in the distribution of population and households in TAZ 2776 by the year 2035 since no future development projects are located there.

2.6.2 CTPS Travel Demand Model

Field survey work conducted by Cambridge Economic Research shows that there are significantly more jobs in TAZ 2774.2 than in 2774.1. TAZ 2774.2 contains Executive Plaza, the businesses on the south side of President Avenue, and box retail outlets on the west side of Main Street. TAZ 2774.1 is mainly residential. As is shown in Table 2.17, it was recommended that the CTPS percentage jobs distribution estimates for these two sub-zones be reversed and that the overall CTPS 2010 data for jobs in TAZ 2774 be kept at 454 jobs.

Table 2.17: 2010 Estimated Jobs within TAZ 2774 and 2776

TAZ	2010 CTPS Jobs	CER 2010 Jobs
2774		
2774.1	227	186
2774.2	186	227
2774.3	41	41
Total 2774	454	454
2776		
2776.1	214	214
2776.2	29	29
Total 2776	243	243
Total Study Area	697	697

Source: CTPS and Cambridge Economic Research

The fieldwork done to complete business interviews and land use surveys has been incorporated into the 2035 growth forecasts for the TAZ subzones. Table 2.18 shows the development projects that are currently planned in the study area. The redevelopment of Commonwealth Landing Mill and the surrounding area is expected to produce 650 new jobs in TAZ 2774.3 by 2035. In TAZ 2776.2, the redevelopment of both the Regatta Club site as a restaurant and City Pier as a marina are forecast to produce a total of around 76 jobs.

Table 2.18: Future No-Build – 2035 Planned Projects and Jobs Projections

Planned Developments	Estimated Jobs
TAZ 2774.3	
Commonwealth Landing	525
Restaurant on Remington	125
Total TAZ 2774.3	650
TAZ 2776.2	
Regatta Club	70
Marina at City Pier	6
Total TAZ 2776.2	76

Source: CTPS and Cambridge Economic Research

In order to incorporate these planned projects into the year 2035 forecasts for the Future No-Build scenario, the new jobs in planned projects were added to the 2010 jobs distribution estimates. Table 2.19 shows the results of this analysis. Since the increases in jobs in planned projects under the Future No-Build scenario are so significant, they could not be accommodated within the original CTPS 2035 forecasts for the two TAZ. It was recommended that the CTPS forecasts for TAZ 2774 be increased by a net of 569 jobs to match the CER forecast. Forecasts for TAZ 2776 were increased by 39 jobs. This results in a redistribution of jobs as a greater portion of Fall River jobs will be located in the Focus Area TAZ than was originally anticipated in the CTPS forecast.

Table 2.19: Future No-Build – 2035 Jobs Projections for Transportation Analysis Subzones

TAZ	CTPS Jobs Estimate	Net CER Forecast	% Jobs
TAZ 2774			
2774.1	N/A	204	18%
2774.2	N/A	249	23%
2774.3	N/A	651	59%
Total TAZ 2774	535	1,104	100%
TAZ 2776			
2776.1	N/A	221	69%
2776.2	N/A	98	31%
Total TAZ 2776	280	319	100%

Source: CTPS and Cambridge Economic Research

Table 2.20 compares the changes in population, households, and jobs in the TAZ that encompass the Focus Area with overall changes in the region that includes the cities of Fall River, Swansea, and Somerset. Forecast growth of population within the Study Corridor is expected to be in line with regional averages. Growth in jobs in the Focus Area is, however, expected to far exceed that of the region.

Table 2.20: Future No-Build – 2035 Change in Population and Jobs

	2010	2035	Study Area Change	Study Area % Change	Regional % Change
Population	3,274	3,747	473	14%	15%
Households	1,391	1,652	261	19%	19%
Jobs	697	1,423	727	104%	14%

Regional data includes Fall River, Somerset and Swansea

2.7 Future No-Build Traffic Volumes and Analysis

The anticipated changes in population, households and employment were incorporated into the CTPS model along with anticipated growth rates within the region in order to determine projected traffic volumes for the year 2035.

Traffic volume exhibits showing peak hour volumes throughout the Regional Transportation Impact Area and Focus Area, are provided in Figures 2.40 through 2.42.

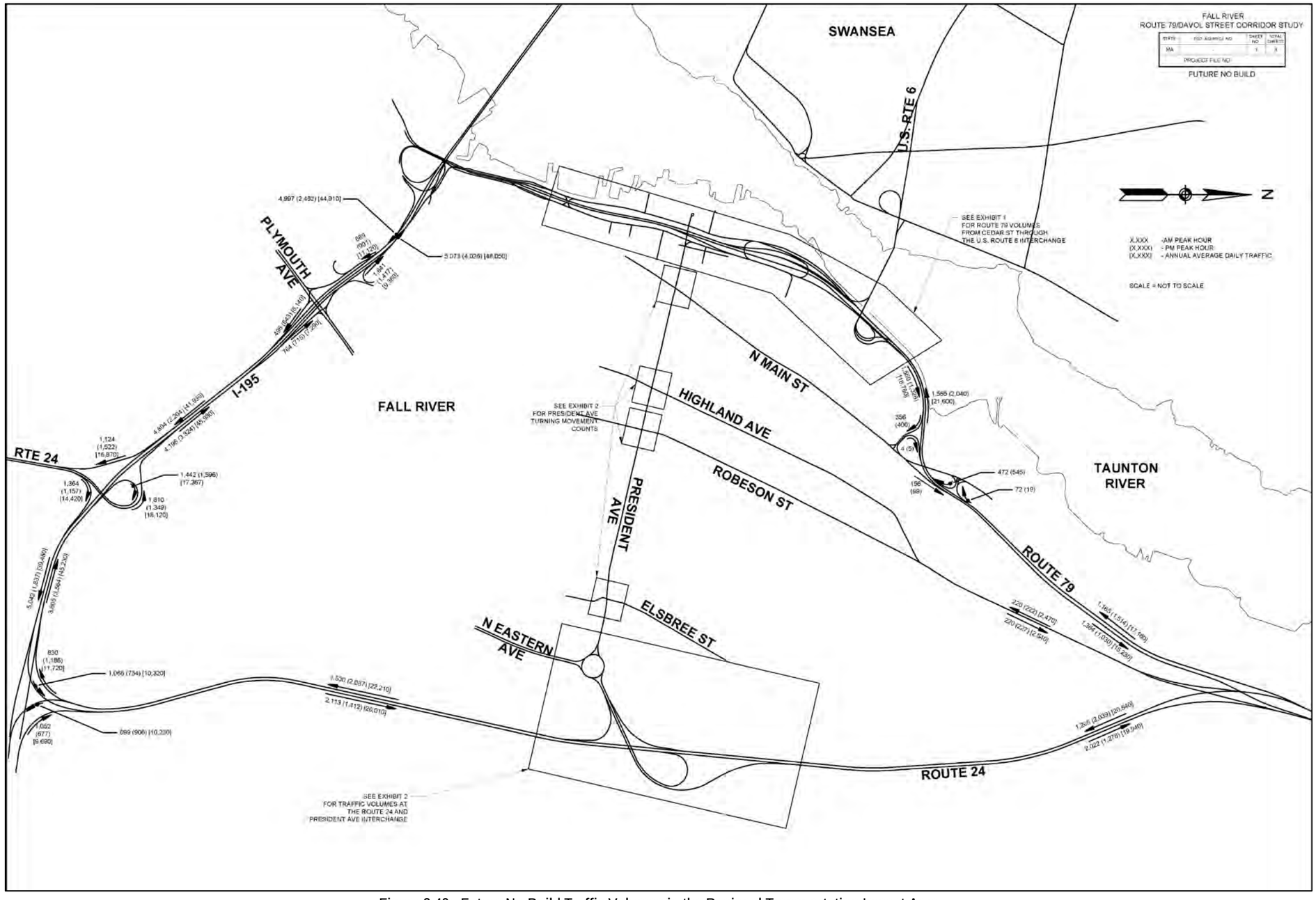


Figure 2.40: Future No-Build Traffic Volumes in the Regional Transportation Impact Area

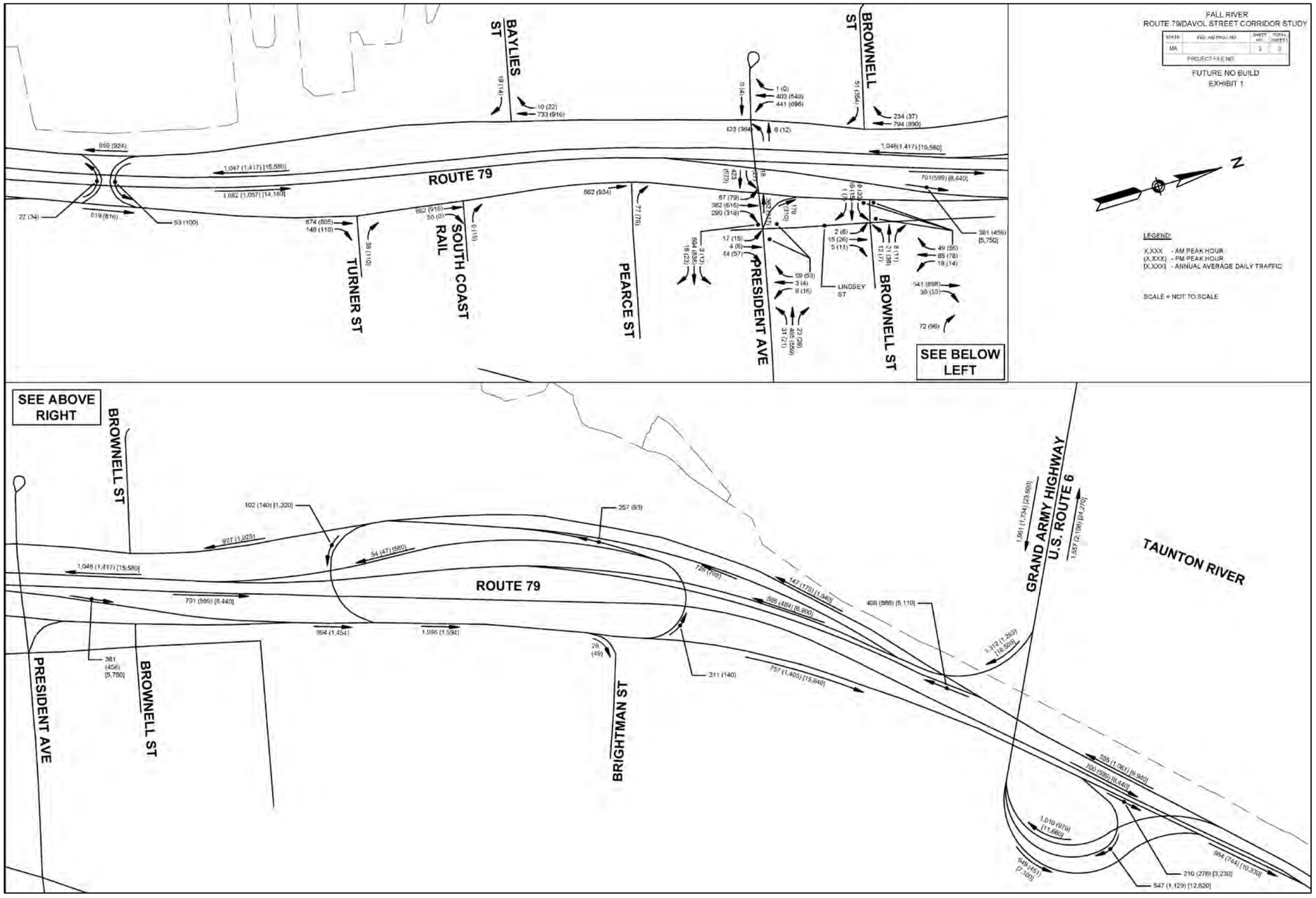


Figure 2.41: Future No-Build Traffic Volumes in the Focus Area

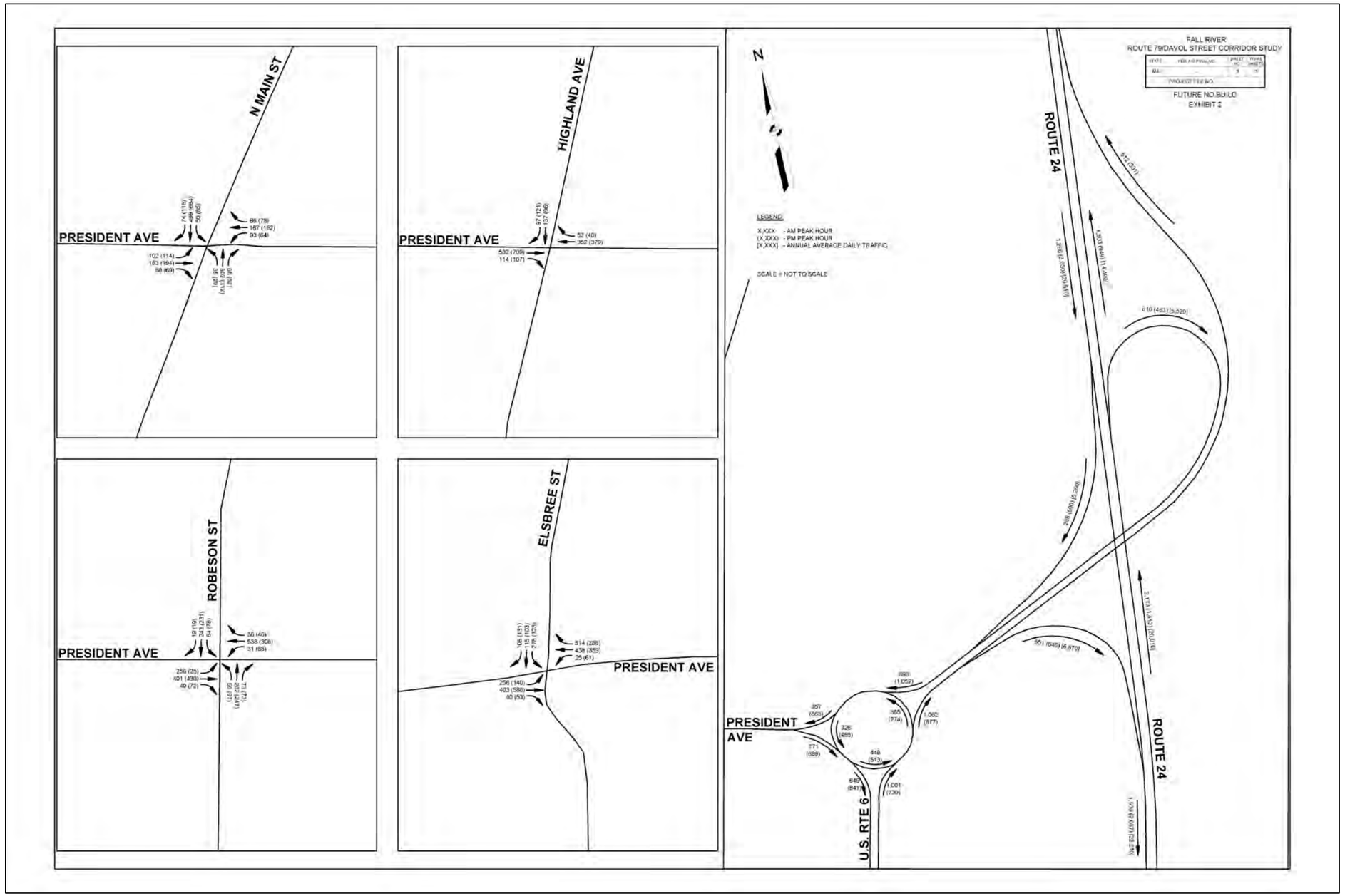


Figure 2.42: Future No-Build Traffic Volumes along President Avenue

Throughout the Regional Transportation Impact Area, the No-Build Travel Demand Model showed varying increases in traffic volumes during the peak travel hours. Traffic along side streets and minor interchanges within the regional area is expected to remain mostly unchanged between 2012 and 2035 since little development is anticipated in those areas. Along more major routes, such as Route 24, Route 79, I-195, U.S. Route 6 and President Avenue, the peak hour traffic volumes are anticipated to increase by an average annual rate of 0.75%.

Within the project Focus Area, the future No-Build traffic volume changes are driven by the planned developments along the riverfront. The currently planned developments of the Regatta Club, the Marina at City Pier, South Coast Rail, Commonwealth Landing Mill and the Restaurant on Remington Avenue are expected to increase the population within the Focus Area by 112 and provide 726 new jobs. The new jobs provided by the developments will increase the morning peak hour traffic going towards the riverfront along westbound President Avenue, Davol Street East and along the northbound to southbound Brightman Street U-turn. In the afternoon peak hour traffic leaving the waterfront will increase, particularly along Davol Street West, the southbound to northbound Cedar Street U-turn and eastbound President Avenue.

Overall, throughout the Regional Transportation Impact Area and the Focus Area, while traffic operations do worsen due to added traffic, there are limited locations throughout the region that do not operate well.

As shown in Tables 2.21 through 2.24, I-195 generally operates at LOS D in the morning hours, but operates at LOS C or better in the afternoon peak hour. This shows only a slight reduction in operations versus the existing conditions.

Conditions along President Avenue are worsened compared to existing due to increased traffic volumes and no geometric roadway improvements. At the intersection with Davol Street West, the LOS of the southbound movement is worsened from B to C during the morning and to LOS E during the afternoon peak hour. At the intersection with Davol Street East, the northbound movement along Davol Street East is worsened for all turning movements. Queuing lengths are between 200 and 300 feet along Davol Street at these intersections. To the east, the southbound movement at Highland Avenue worsens from a LOS D to LOS F in the morning peak hour with a queue length of roughly 150 feet as this intersection does not require President Avenue traffic to stop. At the intersection with Robeson Street, the overall LOS during the morning peak hour worsens from C to E with long queue lengths in all directions. At the rotary with North Eastern Avenue, the intersection delay and queues are roughly the same in the PM peak hour as in the existing conditions. In the AM peak hour, the LOS is worsened to E with an eastbound queue of vehicles approximately 580 feet long.

At the interchange between Route 24 and Route 79, the northbound on-ramp from Route 79 to Route 24 operates at LOS D in the morning peak hour but operates at LOS C in the afternoon peak hour. Conversely, the southbound off-ramp from Route 24 to Route 79 operates at LOS C in the morning peak hour, but conditions worsen to LOS E in the afternoon. In the existing conditions, these ramps operate at LOS C or better at all times.

Table 2.21: Future No-Build (2035) Conditions along All Freeway Segments versus Existing (2012) Conditions

FREEWAY SEGMENTS	Existing Conditions				Future No-Build Conditions			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Route 24 - Northbound								
North of I-195	B	15.1	A	10.4	B	16.5	A	11.0
North of President Avenue Off-Ramp	A	10.3	A	6.9	B	11.7	A	7.4
North of President Avenue On-Ramp	B	12.9	A	9.0	B	15.7	A	10.0
North of Highland Avenue	B	14.6	A	10.4	B	17.5	B	11.7
North of Route 79	C	23.5	B	16.7	D	31.1	C	19.9
Route 24 - Southbound								
North of Route 79	B	15.3	C	21.9	C	20.9	D	33.5
South of Route 79	A	9.4	B	12.9	B	11.6	B	17.6
South of Highland Avenue	A	7.6	A	11.0	A	9.9	B	15.9
South of President Avenue Off-Ramp	A	5.4	A	7.8	A	7.6	B	11.2
South of President Avenue On-Ramp	A	9.6	B	12.8	B	11.9	B	16.3
I-195 - Eastbound								
West of Plymouth Avenue Off-Ramp	D	27.3	A	10.8	D	27.7	B	12.6
Between Plymouth Avenue Ramps	C	22.4	A	6.7	C	22.9	A	7.9
East of Plymouth Avenue On-Ramp	C	25.7	A	10.2	D	26.2	B	11.4
East of SB Route 24 Off-Ramp	C	19.3	A	3.5	C	19.2	A	3.5
East of NB Route 24 On-Ramp	D	27.1	A	9.6	D	28.0	A	9.5
East of NB Route 24 Off-Ramp	C	20.8	A	5.8	C	20.8	A	5.7
East of SB Route 24 On-Ramp	C	24.9	A	9.9	C	25.3	A	10.4
I-195 - Westbound								
East of NB Route 24 Off-Ramp	B	17.4	B	14.3	C	21.2	B	15.9
West of NB Route 24 Off-Ramp	B	12.3	B	11.1	B	15.4	B	12.3
West of SB Route 24 On-Ramp	B	15.2	B	15.6	C	19.9	C	18.5
West of SB Route 24 Off-Ramp	A	10.2	A	9.4	B	12.3	A	10.3
West of NB Route 24 On-Ramp	B	17.4	B	16.3	C	22.2	B	17.3
Between Plymouth Avenue Ramps	B	13.0	B	12.5	B	17.8	B	13.5
West of Plymouth Avenue On-Ramp	B	15.4	B	12.5	C	20.9	B	17.4

Table 2.21: Future No-Build (2035) Conditions along All Freeway Segments versus Existing (2012) Conditions (Continued)

FREEWAY SEGMENTS	Existing Conditions				Future No-Build Conditions			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Route 79 - Northbound								
South of Davol Street Off-Ramp	A	6.8	A	7.6	A	8.4	A	8.2
North of Davol Street Off-Ramp	A	4.6	A	3.7	A	5.5	A	4.7
North of North Main Street Off-Ramp	A	7.6	A	5.7	A	9.4	A	7.2
North of SB North Main Street On-Ramp	A	8.3	A	5.7	A	9.4	A	7.3
South of Route 24	A	8.3	A	6.3	A	10.6	A	8.0
Route 79 - Southbound								
South of Route 24	A	5.9	A	8.7	A	9.1	B	11.8
South of North Main Street Off-Ramp	A	5.4	A	8.2	A	8.5	B	11.6
South of North Main Street On-Ramp	B	12.5	A	8.1	B	12.2	B	15.9
South of U.S. Route 6 Off-Ramp	A	4.2	A	4.2	A	4.3	A	8.3
South of Davol Street Off-Ramp	A	3.3	A	4.9	A	3.2	A	6.9
South of U.S. Route 6 On-Ramp	A	7.7	A	8.6	A	7.7	A	10.7
South of Davol Street On-Ramp	A	8.2	A	8.9	A	8.2	B	11.0

Table 2.22: Future No-Build (2035) Conditions along All Weaving Segments versus Existing (2012) Conditions

WEAVING SEGMENTS	Existing Conditions						Future No-Build Conditions					
	AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
	LOS	v/c	Density (pc/mi/ln)	LOS	v/c	Density (pc/mi/ln)	LOS	v/c	Density (pc/mi/ln)	LOS	v/c	Density (pc/mi/ln)
NB Route 79 between U.S. Route 6 frontage road and North Main Street Off-Ramp	A	0.33	8.8	A	0.27	7.1	B	0.38	10.3	A	0.33	8.7
Davol Street East between Cory Street U-turn and Brightman Street U-Turn	A	0.18	8.4	B	0.29	14.5	A	0.22	9.5	B	0.3	14.8
Davol Street West between Brightman Street U-turn and Cory Street U-turn	B	0.35	14.7	B	0.37	15.8	B	0.45	19.7	B	0.42	18.1

Table 2.23: Future No-Build (2035) Conditions along All Ramp Segments versus Existing (2012) Conditions

	Existing Conditions				Future No-Build Conditions			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
RAMP LOCATIONS	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Route 24 & Route 79								
SB Route 24 Off-Ramp to Route 79	B	19.6	C	27.3	C	26.2	E	36.9
SB Route 24 Off-Ramp to Highland Avenue	B	12.5	B	16.8	B	15.2	C	22.6
NB Route 24 On-Ramp from Highland Avenue	B	19.3	B	14.7	C	22.5	B	16.1
NB Route 24 On-Ramp from Route 79	C	27.5	C	20.8	D	33.2	C	24.1
Route 24 & U.S. Route 6 (President Avenue)								
SB Route 24 Off-Ramp to U.S. Route 6	A	1.2	A	5.4	A	4.0	B	11.3
SB Route 24 On-Ramp from U.S. Route 6	B	10.2	B	13.8	B	12.8	B	17.6
NB Route 24 Off-Ramp to U.S. Route 6	B	12.7	A	8.5	B	15.1	A	8.4
NB Route 24 On-Ramp from U.S. Route 6	B	13.4	A	7.6	B	15.8	A	9.5
Route 24 & I-195 (North of I-195)								
WB I-195 Off-Ramp to Route 24 NB	C	24.9	C	20.7	D	28.5	C	22.6
WB I-195 On-Ramp from Route 24 SB	B	17.5	B	18.8	C	22.9	C	22.7
EB I-195 Off-Ramp to Route 24 NB	D	32.0	B	15.3	D	32.9	B	15.3
EB I-195 On-Ramp from Route 24 SB	C	22.8	A	8.5	C	23.0	A	9.4
Route 24 & I-195 (South of I-195)								
WB I-195 Off-Ramp to Route 24 SB	C	21.7	C	22.8	C	27.6	C	26.9
WB I-195 On-Ramp from Route 24 NB	C	24.2	C	23.0	D	29.7	C	24.0
EB I-195 Off-Ramp to Route 24 SB	D	28.6	B	14.8	D	29.2	B	17.0
EB I-195 On-Ramp from Route 24 NB	D	30.3	B	14.3	D	31.4	B	14.2
I-195 & Plymouth Avenue								
WB I-195 Off-Ramp to Plymouth Avenue	C	22.2	C	20.8	C	26.3	C	21.8
WB I-195 On-Ramp from Plymouth Avenue	B	18.3	B	19.3	D	32.8	C	26.7
EB I-195 Off-Ramp to Plymouth Avenue	D	29.3	B	14.6	D	29.6	B	16.9
EB I-195 On-Ramp from Plymouth Avenue	C	27.7	B	14.0	D	28.1	B	15.0
Route 79 & Main Street								
SB Route 79 Off-Ramp to Main Street	A	6.7	B	10.1	B	10.6	B	13.9
SB Route 79 On-Ramp from Main Street	A	8.0	B	12.9	B	12.5	B	16.6
NB Route 79 On-Ramp from SB Main Street	B	10.9	A	8.7	B	12.8	B	10.4
NB Route 79 On-Ramp from NB Main Street	B	11.8	A	9.5	B	14.4	B	11.5
Route 79 & U.S. Route 6								
SB Route 79 Off-Ramp to U.S. Route 6	B	11.4	B	16.8	B	16.4	C	20.9
SB Route 79 Off-ramp to Davol Street West	A	7.1	A	9.5	A	7.2	B	12.1
SB Route 79 On-Ramp from U.S. Route 6	B	11.1	B	12.0	B	11.1	B	14.1
SB Route 79 On-Ramp from Davol Street East	A	3.5	A	4.4	A	3.6	A	6.8
NB Route 79 Off-Ramp to Davol Street East	A	5.7	A	6.7	A	7.7	A	7.5

Table 2.24: Future No-Build (2035) Conditions at All Intersections versus Existing (2012) Conditions

Location	Existing Conditions										Future No-Build Conditions									
	AM Peak Hour					PM Peak Hour					AM Peak Hour					PM Peak Hour				
	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue
Davol Street East at Turner Street	A	0.4				A	0.9				A	0.6				A	2.2			
NB Through/Right	A	0.0	0.27	0	4	A	0.0	0.30	0	0	A	0.0	0.28	0	4	A	0.0	0.34	1	8
WB Right	B	11.5	0.05	20	48	B	13.3	0.15	31	61	B	11.8	0.08	23	45	C	15.1	0.32	42	69
Davol Street East at South Coast Rail	N/A	N/A	N/A			N/A	N/A	N/A			A	0.0				A	0.2			
NB Through/Right	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	0.0	0.28	0	0	A	0.0	0.39	0	0
WB Right	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	0.0	0.00	0	0	B	12.2	0.04	11	34
Davol Street East at Pearce Street	A	0.5				A	0.8				A	2.1				A	1.3			
NB Through	A	0.0	0.21	0	4	A	0.0	0.34	1	17	A	0.0	0.21	1	21	A	0.0	0.31	0	8
WB Right	B	10.9	0.06	20	43	B	12.8	0.12	33	59	B	12.4	0.23	31	53	B	14.1	0.21	34	58
Davol Street East at President Avenue	B	18.3	0.56			B	19.7	0.61			A	20.1	.62			B	19.4	0.63		
NB Left/Through	B	19.5	0.57	79	128	C	21.9	0.75	142	233	C	20.4	0.63	89	148	C	22.8	0.77	131	199
NB Right	C	33.7	0.82	125	215	C	26.0	0.76	147	242	D	12.2	0.88	165	279	C	26.6	0.77	136	231
EB Left/Through	A	8.1	0.28	61	122	B	10.6	0.34	70	141	A	8.2	0.30	71	126	B	12.2	0.54	108	188
WB Through	B	18.3	0.46	91	112	C	21.7	0.55	94	109	B	19.0	0.54	94	107	C	21.3	0.51	89	110
WB Right	B	16.6	0.13	1	14	B	19.8	0.24	30	97	B	16.6	0.13	7	40	B	19.7	0.22	26	87
Davol Street East at Brownell Street	A	1.0				A	1.0				A	1.1				A	1.2			
NB Through/Right	A	0.0	0.22	3	63	A	0.0	0.38	5	72	A	0.0	0.24	3	32	A	0.0	0.40	3	63
WB Right	B	10.6	0.08	28	50	B	13.7	0.17	34	54	A	9.9	0.10	28	55	B	12.7	0.20	35	54
Davol Street West at Brownell Street	A	0.1				A	0.2				A	0.9				A	18.0			
SB Through/Right	A	0.0	0.33	1	12	A	0.0	0.36	1	14	A	0.0	0.35	1	13	A	0.0	0.41	74	222
EB Right	B	11.4	0.02	8	28	B	11.8	0.03	13	36	B	14.2	0.15	24	58	F	61.9	0.96	295	442
Davol Street West at President Avenue	B	18.6	0.72			C	21.8	0.76			C	24.0	0.81			E	59.5	0.95		
SB Left/Through/Right	B	17.4	0.69	163	253	C	20.9	0.74	177	274	C	24.5	0.81	196	295	E	69.5	1.14	264	289
EB Through/Right	A	0.0	0.00	0	0	B	11.5	0.01	3	19	A	N/A	N/A	N/A	N/A	B	12.8	0.01	2	15
WB Through	B	10.8	0.01	4	22	B	11.6	0.02	8	31	A	9.8	0.01	2	14	C	27.9	0.81	7	28
WB Left	C	21.3	0.75	133	214	C	24.0	0.78	156	233	C	23.5	0.81	141	223	B	12.9	0.02	149	224
Davol Street West at Baylies Street	A	0.3				A	0.2				A	0.4				A	0.4			
SB Through/Right	A	0.0	0.30	0	0	A	0.0	0.34	0	0	A	0.0	0.35	0	0	A	0.0	0.41	0	2
EB Right	B	11.1	0.03	14	40	B	11.6	0.02	8	30	B	11.9	0.06	12	37	B	12.8	0.06	11	34
Lindsey Street at Brownell Street	A	7.6				A	7.5				A	8.0				A	7.7			
NB Left/Through/Right	A	9.5	0.03	16	41	A	10.0	0.06	20	46	A	9.9	0.04	16	42	B	10.5	0.07	23	47
SB Left/Through/Right	A	9.9	0.14	36	57	B	10.2	0.16	53	124	B	10.6	0.21	67	152	B	11.1	0.23	40	73
EB Left/Through/Right	A	3.5	0.01	1	9	A	4.5	0.02	4	24	A	3.5	0.02	2	15	A	4.6	0.03	3	18
WB Left/Through/Right	A	2.2	0.01	0	4	A	1.1	0.00	1	12	A	2.2	0.01	16	84	A	1.0	0.01	2	16

Table 2.24: Existing Conditions (2012) at all Intersections versus Existing (2012) Conditions (Continued)

Location	Existing Conditions										Future No-Build Conditions									
	AM Peak Hour					PM Peak Hour					AM Peak Hour					PM Peak Hour				
	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue
Lindsey Street at President Avenue	A	1.6				A	2.0				A	1.9				A	2.3			
NB Left/Through/Right	B	14.8	0.14	35	70	C	17.9	0.23	50	83	C	18.7	0.23	57	91	C	21.2	0.31	48	83
SB Left/Through/Right	B	12.2	0.13	62	168	C	18.7	0.23	146	341	B	13.4	0.17	162	383	C	20.5	0.27	64	184
EB Left/Through/Right	A	0.1	0.21	4	26	A	0.4	0.24	10	47	A	0.1	0.24	3	22	A	0.5	0.30	9	43
WB Left/Through/Right	A	2.1	0.13	83	171	A	1.5	0.19	126	218	A	2.2	0.15	109	191	A	1.5	0.20	70	133
President Avenue at North Main Street	C	22.4	0.79			C	27.2	0.83			C	23.8	0.82			D	40.6	0.93		
NB Left/Through/Right	C	24.7	0.75	158	271	C	33.3	0.81	236	414	B	11.3	0.54	203	396	B	10.9	0.50	212	428
SB Left/Through/Right	B	19.8	0.62	127	238	C	21.3	0.49	134	237	C	33.7	0.95	353	483	E	64.3	1.06	399	409
EB Left	B	13.8	0.14	32	125	B	16.6	0.22	78	306	C	20.2	0.47	50	95	C	30.9	0.62	67	129
EB Through/Right	C	26.6	0.82	211	347	C	31.9	0.85	283	501	C	20.7	0.56	105	170	C	28.8	0.64	112	203
WB Left	B	14.8	0.20	16	42	B	17.9	0.26	18	58	C	20.4	0.49	51	100	C	25.3	0.38	35	75
WB Through/Right	B	15.6	0.39	92	168	B	19.0	0.47	135	241	C	21.0	0.57	89	172	C	26.4	0.54	104	192
President Avenue at Highland Avenue	A	6.7				B	8.3				A	33.2				B	17.3			
SB Left/Through/Right	D	31.5	0.66	71	124	E	48.3	0.79	75	139	F	192.0	1.25	75	146	F	113.4	1.04	90	191
EB Left/Through/Right	A	0.0	0.40	10	58	A	0.0	0.48	3	20	A	0.0	0.41	0	0	A	0.0	0.52	12	88
WB Left/Through/Right	A	0.0	0.15	0	0	A	0.0	0.23	0	3	A	0.0	0.35	0	0	A	0.0	0.30	0	0
President Avenue at Robeson Street	C	32.1	0.84			B	16.2	0.68			E	71.9	1.13			C	21.9	0.76		
NB Left/Through/Right	D	48.0	0.81	292	411	B	17.2	0.66	160	279	D	43.0	0.75	193	317	C	26.5	0.80	255	389
SB Left/Through/Right	D	50.0	0.82	261	318	B	15.4	0.58	151	258	E	56.0	0.88	201	301	B	19.3	0.61	175	280
EB Left/Through/Right	C	27.6	0.85	494	770	B	17.2	0.70	226	437	F	151.5	1.25	797	809	B	19.7	0.69	358	701
WB Left/Through/Right	B	12.7	0.41	158	275	B	14.7	0.58	245	462	B	19.3	0.69	309	466	C	21.6	0.73	417	525
President Avenue at Elsbree Street	C	20.4	0.64			B	17.3	0.70			C	30.3	0.79			B	19.8	0.67		
SB Left	C	29.8	0.77	114	196	C	21.6	0.69	96	161	D	42.8	0.88	125	212	C	26.1	0.78	138	230
SB Through/Right	C	20.2	0.47	70	129	B	15.7	0.33	54	101	C	25.8	0.59	71	131	B	16.5	0.44	70	136
EB Left	C	29.8	0.73	89	154	C	29.2	0.70	65	123	E	56.2	0.89	91	167	C	30.6	0.67	65	115
EB Through/Right	A	9.9	0.27	54	91	B	15.3	0.65	91	145	B	15.8	0.34	58	105	B	16.9	0.63	77	94
WB Left	F	103.2	0.78	14	38	C	24.9	0.49	31	60	E	55.8	0.60	15	41	C	31.9	0.56	30	55
WB Through	B	17.9	0.46	90	148	B	14.9	0.40	62	99	C	27.3	0.61	121	215	B	17.5	0.42	70	117
WB Right	B	17.2	0.32	87	152	B	14.0	0.19	53	96	C	25.2	0.41	101	184	B	16.3	0.19	51	89
President Avenue Rotary	C	16.8				F	52.9				E	38.7				F	52.9			
NB Left	A	7.6	0.32	N/A	35	A	6.5	0.21	N/A	20	B	13.4	0.56	N/A	88	A	6.5	0.21	N/A	20
NB Right	C	18.0	0.73	N/A	168	C	16.8	0.69	N/A	145	D	31.3	0.87	N/A	268	C	16.8	0.69	N/A	145
EB Through/Right	C	24.4	0.84	N/A	250	F	129.3	1.22	N/A	805	F	86.4	1.10	N/A	583	F	129.3	1.22	N/A	805
WB Left	A	4.4	0.00	N/A	0	A	3.9	0.00	N/A	0	A	5.0	0.00	N/A	0	A	3.9	0.00	N/A	0
WB Through	B	10.5	0.47	N/A	63	A	7.7	0.34	N/A	38	B	11.6	0.46	N/A	60	A	7.7	0.34	N/A	38

2.8 Multi-Modal Transportation

In the Future No-Build Condition, it is assumed that none of the pedestrian, bicycle or public transit accommodations will be changed with the exception of the South Coast Bikeway and its connections, and the South Coast Rail project.

2.8.1 Proposed Bicycling Improvements

The 2012 Regional Transportation Plan issued by the Southeastern Regional Planning & Economic Development District (SRPEDD) proposes the creation of the South Coast Bikeway. This bikeway will be located between Wareham, Massachusetts and the Swansea/Warren, Rhode Island border. As seen in Figure 2.43, the regional route would connect a number of existing and proposed bicycle paths and on-road bike routes. This route would include the existing bicycle path on the Veterans Memorial Bridge, the existing Quequechan River Greenway and its planned extension, and a future connection between the two. Chapter 12 of the Regional Transportation Plan states that "the proposed South Coast Bikeway remains the priority in this region for bikeway construction. It offers the best opportunity to connect existing bikeways and serve as a viable recreational and commuting facility."

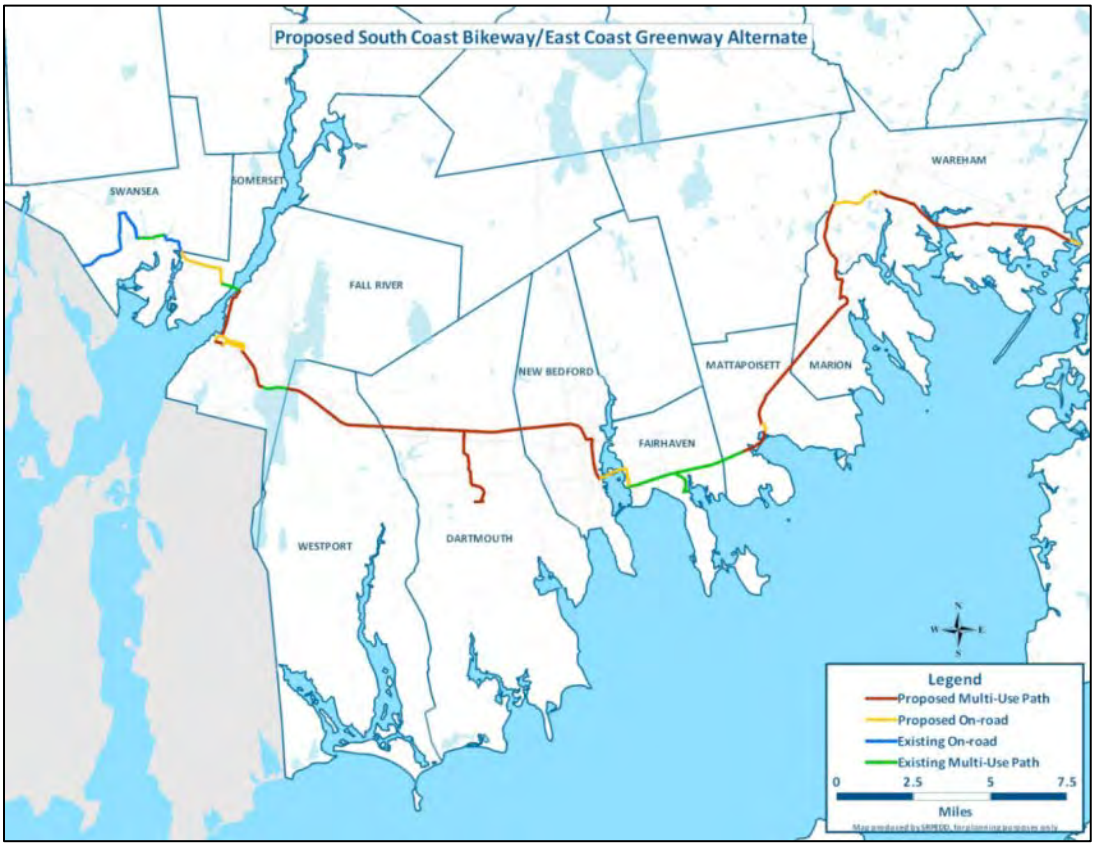


Figure 2.43: Proposed South Coast Bikeway

The Regional Transportation Plan also proposes the creation of a Fall River Bike Path. As proposed, the project includes an existing segment from the Westport town line to the Brayton Avenue extension along the abandoned Fall River Branch of the Old Colony Railroad and a planned segment from Brayton Avenue to Quequechan Street along the same railroad right-of-way.

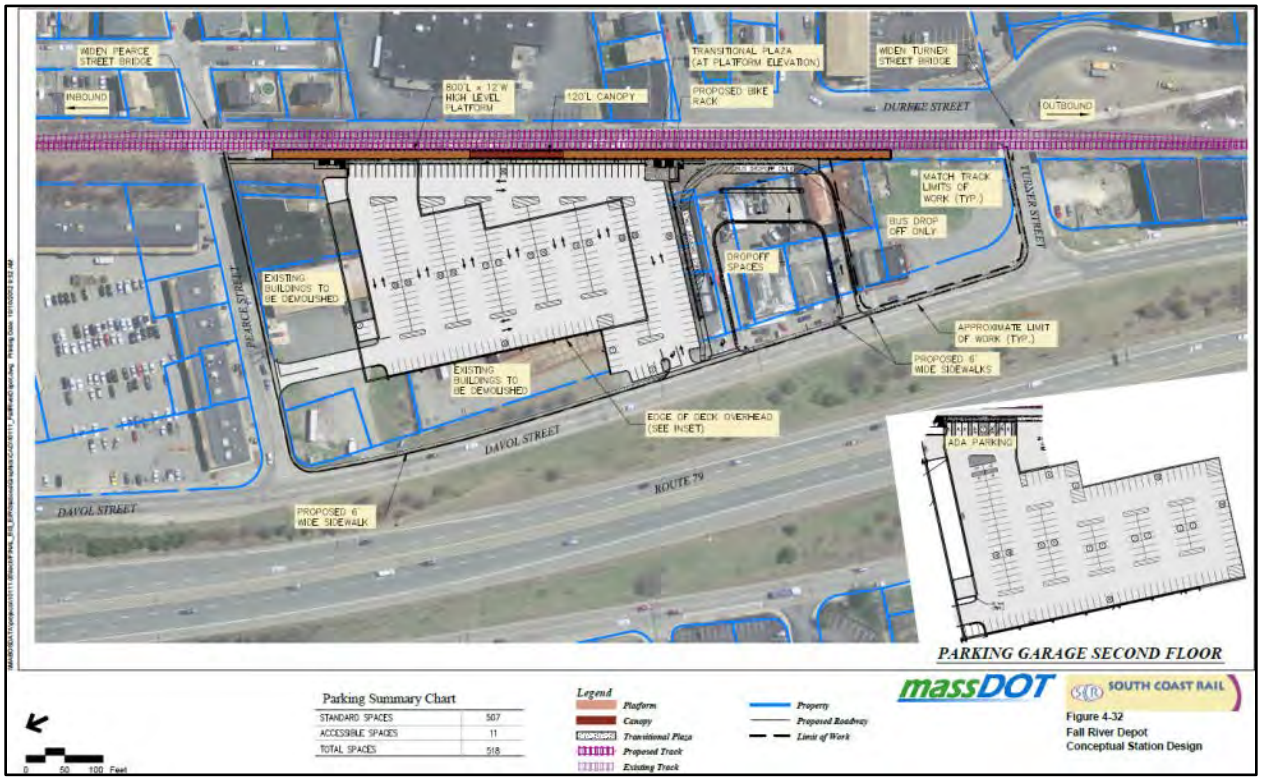
The RTP proposes that the bike path eventually continue along the northern side of the Quequechan River, connect via Plymouth Avenue, Bedford Street and Central Street to the waterfront, and then continue as an off-road bikeway connecting to the bike path on the Veterans Memorial Bridge.

The Phase II extension of the existing Quequechan River Path received a $785,000 planning grant in January 2012 to produce design and construction documents. A public hearing for the project was held in June 2013.

2.8.2 Proposed Public Transit Improvements

As noted in the Existing Conditions section, SRTA recently expanded the evening service hours of Routes 2 and 14, and is also considering changes to the routes to more efficiently serve Commonwealth Landing. The South Coast Rail project will extend the Massachusetts Bay Transportation Authority (MBTA) commuter rail service to Fall River and New Bedford. The Fall River Depot is proposed to be located east of East Davol Street and between Pearce Street and Turner Street. This station will serve as the primary station for Fall River and will have a 518-space parking garage. A Battleship Cove station is proposed at the end of the line, near Water Street. This station would have no automobile parking and might have limited frequency.

The proposed location of the Fall River Depot is between the railroad tracks and Davol Street East (see Figure 2.44, noting that north is to the left in this diagram). With Davol Street East acting as a one-way frontage road and the rail tracks preventing access to the site directly from the east, the primary access to the station from the large residential areas to the east will be through Pearce Street. The conceptual design for the station includes a bus drop-off area adjacent to the train platform. Local bus route additions and modifications were proposed in a Feeder Bus Plan released as part of the Final Environmental Impact Report (FEIR) for South Coast Rail in 2013. The plan calls for the SRTA Route 2 to be routed close enough to the proposed Fall River Depot that no bus rerouting is necessary, provided that an adequate pedestrian path were provided between the station and North Main Street. There is an existing sidewalk along the eastern side of Davol Street East. The plan further states that in the event an adequate pedestrian pathway between North Main Street and Fall River Depot cannot be provided, the recommended alternative is to divert SRTA Route 2 at Odd Street (just north of Cedar Street) to Durfee Street to Turner Street to Davol Street East, and then via President Avenue to return to North Main Street. However, the plan adds that "the need for a route deviation is not confirmed" because the pedestrian path alternative is preferable.



Source: South Coast Rail Final Environmental Impact Statement and Environmental Impact Report

Figure 2.44: Fall River Depot Conceptual Station Design

2.9 Issues, Constraints and Opportunities

Throughout the study of the existing and no-build conditions of the Regional Transportation Impact Area and Focus Area, it can be seen that there are a number of issues, constraints and opportunities that will guide the development of alternatives in the following chapter.

2.9.1 Issues

The existing conditions within the Focus Area present a number of issues that can be linked to the Evaluation Criteria discussed in Chapter 1. These criteria are Mobility, Safety, Land Use and Economic Development, Health and Environmental Effects, and Community Effects.

2.9.1.1 Mobility

Local mobility within the Focus Area and Regional Transportation Impact Area sees some issues due to limited connectivity. Within the Focus Area, local connectivity between Fall River and the waterfront is limited by Route 79. The only east-west crossing is at President Avenue. Previously, Brightman Street had full access to Davol Street West, Route 79, Davol Street East and the Brightman Street Bridge which

crossed the Taunton River to Somerset. The construction of the Veterans Memorial Bridge removed this connectivity and reconfigured Brightman Street to one-way eastbound, away from the waterfront.

2.9.1.2 Safety

Six intersections within the Focus Area have crash rates higher than both the State and District 5 averages. These intersections are Davol Street West at the Cedar Street U-turn, Davol Street East at the Cedar Street U-turn, Davol Street East at President Avenue, President Avenue at Lindsey Street, President Avenue at North Main Street and Lindsey Street at Brownell Street.

The crashes at the Cedar Street U-turn are related to poor sight distance along Davol Street due to vegetation and the berm supporting Route 79. No deceleration or acceleration lanes are present for the U-turn and no signs are present along Davol Street West alerting drivers to the likelihood of merging traffic.

The crashes along President Avenue at Davol Street East and Lindsey Street are due to congestion at the intersection and poor sight distance for Lindsey Street traffic. Vehicles turning onto President Avenue from Lindsey Street must cross through the queue of westbound President Avenue vehicles. There is also no crosswalk at Lindsey Street, requiring pedestrians to use the crosswalks at Davol Street East. However, pedestrians still cross at Lindsey Street. Three collisions involving pedestrians have been reported at these intersections.

The intersection of President Avenue and North Main Street sees a high number of collisions due to congestion, a lack of an exclusive left-turn phase, and a lack of exclusive left-turn lanes along North Main Street.

The intersection of Brownell Street and Lindsey Street has poor sight distance of eastbound Brownell Street traffic, as this traffic is turning onto Brownell Street from Davol Street East. Brownell Street traffic is not required to stop at the intersection, which is likely unanticipated by Lindsey Street traffic.

2.9.1.3 Land Use and Economic Development

Economically, Fall River is currently experiencing low income with high unemployment and poverty. Real estate prices have remained low in the area, indicating weak demand. On the west side of Davol Street West, existing sites are underutilized. Along the eastern side of Davol Street East, parcels are shallow as they are bound by Davol Street East and the railroad.

2.9.1.4 Health and Environmental Effects

Currently, the City of Fall River maintains a combined sewer system (storm water and sanitary sewer) that outlets into the Taunton River at Bicentennial Park and at City Pier, which is considered a wild and scenic river and a rare species priority habitat. There is a screening and disinfection facility at the Bicentennial Park outlet, but no such facility at the City Pier outlet.

2.9.1.5 Community Effects

Route 79 currently acts as a visual barrier between Fall River and the waterfront. It is also a physical barrier, as it limits the number of east-west crossings between the waterfront and communities within Fall River. Currently, there is only one roadway and pedestrian east-west crossing within the Focus Area at President Avenue.

Pedestrians and Bicyclists within the Focus Area have limited options when traveling between Fall River and the waterfront. There are only two east-west crossings south of the Veterans Memorial Bridge. Pedestrians are able to cross under Route 79 at Central Street near I-195 and at President Avenue, nearly one mile to the north.

The existing shared-use path that crosses the Veterans Memorial Bridge ends at Wellington Street. Bicyclists then must travel through small local roads in order to reach President Avenue. No designated bicycle facilities are provided elsewhere within the Focus Area. While sidewalks are provided along all roadways, no ADA-compliant wheelchair ramps are present at any of the intersections studied. Most wheelchair ramps are located at the curb's apex, which can direct pedestrians into the intersection rather than along the crosswalk.

At signalized intersections, where pedestrian signals are provided, no countdown timers are present. Pedestrians are not permitted to cross at the intersection of President Avenue and Lindsey Street, requiring that pedestrians and bicyclists use an unsignalized crosswalk across the westbound President Avenue right-turn lane.

2.9.2 Constraints

Within the Regional and Focus Areas, there are a number of constraints that will help to guide the development of alternatives within the Focus Area and Regional Transportation Impact Area. In addition to those constraints listed below, any alternatives developed should avoid any adverse impacts to the environment, existing businesses and homes, including increases in noise.

2.9.2.1 Mobility

Local connectivity east of Davol Street East is limited by the railroad that runs north-south and will support South Coast Rail. There are existing roadway crossings of the railroad at Brightman Street, Brownell Street, President Avenue, Pearce Street and Turner Street. Alternatives should line up proposed east-west connections with these existing railroad connections if feasible.

2.9.2.2 Safety

All alternatives developed shall comply with ADA, AASHTO and MassDOT standards and regulations. In addition, emergency vehicle access should be a consideration in alternatives development.

2.9.2.3 Land Use and Economic Development

East of Davol Street East, there is limited area for redevelopment. The location of the railroad creates shallow parcels. The largest area between the railroad and Davol Street East is currently occupied by Executive Plaza Shopping Center.

Bicentennial Park is 4(f) land and any impacts to this area should be avoided. Adverse impacts to existing homes and businesses should also be avoided.

2.9.2.4 Health and Environmental Effects

All alternatives developed as part of the project development process will be studied to determine if there are noise impacts associated with them in accordance with FHWA's Type I program. There is an existing Priority Location near the I-195 and Route 24 interchange that is included in MassDOT's Type II program. Any diversions created by the developed alternatives may worsen conditions at this Priority Location.

The Taunton River is designated as wild and scenic, requiring additional reviews by the US NPS. In addition, it is a rare species priority habitat, so impacts to the river must be avoided. There are two hazardous waste sites within the Focus Area at the electric power substation and at the old Mechanics Mill site.

The existing 100-year and 500-year floodplain is located along the Taunton River and across the area near the southern limits of the Focus Area. These areas are susceptible to flooding. The impacts of climate change should be evaluated during the design and permitting phases of the project, including any adaptation of the alternative required by climate change.

2.9.2.5 Community Effects

Fall River Depot is proposed to be constructed at Taylor Street and Davol Street East as part of the South Coast Rail project. Developed alternatives should be compatible with the I-195/Route 79 Interchange Project, the 2012 Regional Transportation Plan, and South Coast Rail.

2.9.3 Opportunities

The Focus Area offers many opportunities within its existing conditions and through redevelopments that are planned or are ongoing. The waterfront is becoming a regional draw for commercial and residential developments, and the opportunity to reconfigure the Route 79 and Davol Street Corridor will improve safety and circulation for all modes of transportation and will encourage further development along the waterfront and in Fall River. Completion of the South Coast Rail will provide transit oriented development opportunities

2.9.3.1 Mobility

Route 79 has excess capacity which will allow some flexibility in the development of alternatives. Capacity issues anticipated in the No-Build Conditions could be remedied through developed alternatives. Reconfiguration of Route 79, Davol Street West and Davol Street East would provide opportunities to restore Brightman Street access, improve local connectivity between Fall River and the waterfront, and improve access to South Coast Rail.

2.9.3.2 Safety

Alternatives developed for the Focus Area and Regional Transportation Impact Area have the opportunity to introduce ADA compliant crossings for pedestrians at all intersections as well as introduce designated facilities for bicyclists. All alternatives will be developed based on the latest AASHTO and MassDOT standards and regulations.

There are a number of intersections listed in Issues Section 2.9.1 that have safety issues that can be improved through reconfiguration of Route 79, Davol Street West and Davol Street East. The Cedar Street U-turn, President Avenue at Davol Street East and Lindsey Street, and Lindsey Street at Brownell Street could all be reconfigured through developed alternatives.

2.9.3.3 Land Use and Economic Development

Within Fall River, there is a good supply of rental housing which provides ample affordable housing choices for new workers entering the community. There is also a good supply of rental office space within Fall River that can act as a draw for regional businesses. Commonwealth Landing has successful restaurants and offers office space and residential space. This development could act as a catalyst for other developments along the waterfront.

Existing businesses within the Focus Area are net contributors to the local tax base, suggesting that new developments will likely be net contributors as well. Specifically within the Focus Area, there is a lack of existing office space and residential space that provides for future developments.

2.9.3.4 Health and Environmental Effects

The Taunton River is a wild and scenic river and provides habitat for rare species. This encourages the public to learn about the river and also promotes recreational use of the river. Reconfiguration of Route 79, Davol Street West and Davol Street East provides an opportunity to introduce Low Impact Design (LID) standards and Best Management Practices (BMP) for drainage. The addition of shared-use paths and accessible sidewalks will promote better health, as a reconfigured roadway network accommodates and encourages the community to use alternatives modes of transportation including walking, bicycling, and using public transit.

2.9.3.5 Community Effects

Completion of South Coast Rail and Fall River Depot will promote transit oriented development opportunities within the Focus Area. Public transit routes on the SRTA could be expanded or modified to provide better service to South Coast Rail and developments within the Focus Area. The public transit routes could also be modified to provide service on Sundays.

There are existing and proposed shared-use paths north and south of the Focus Area that could be connected and would provide access to South Coast Rail and future developments within the Focus Area.

Reconfiguration of Route 79, Davol Street West and Davol Street East will provide opportunities for landscaping and making the waterfront more pedestrian friendly.

Route 79 / Davol Street Corridor Study

Chapter 3

Alternatives Development

3.1 Development of Alternatives

The development of alternatives was guided by the identification of the issues, constraints, and opportunities within the Focus Area, along with the goals and objectives established in the early stages of the study. The Working Group also provided significant input into the process. As discussed in Chapter 2, the issues and constraints identified are generally related to vehicular and non-vehicular crashes, insufficient pedestrian and bicycle accommodations, limited multimodal connectivity, and low economic development potential within the corridor.

This chapter describes in more detail the alternatives developed to address existing issues, while Chapter 4 provides analyses and evaluation of the alternatives.

3.2 Improvement Alternatives – Location-by-Location

In order to identify immediate improvements within the Focus Area, alternatives were studied on a location-by-location basis. These alternatives address issues related to safety and access issues for pedestrians and bicyclists. By working to solve issues at individual locations, the alternatives developed would have a relatively low cost and could be done with existing resources, or would require only a minimal level of design and funding.

As identified in Chapter 2, there are six locations identified as part of the existing conditions analysis that experience statistically significant crash rates and exceed both the statewide and MassDOT District 5 averages. These locations are:

- Cedar Street U-turn (U-turn at Davol Street West)
- Cedar Street U-turn (U-turn at Davol Street East)
- Davol Street East at President Avenue
- President Avenue at Lindsey Street
- President Avenue at North Main Street
- Lindsey Street at Brownell Street

In the analysis of existing conditions, congestion and capacity were not found to be prominent issues. There are some operational deficiencies along U.S. Route 6 at Highland Avenue, Robeson Street and the President Avenue Rotary, but these locations are considered outside of the Focus Area and are primarily included in analysis for the purpose of determining whether any improvements within the Focus Area would have any detrimental effect on locations outside of the Focus Area but within the Regional Transportation Impact Area. The City of Fall River should consider monitoring these locations for potential future upgrades.

In addition to safety issues, it was also noted during the analyses of existing and No-Build Conditions that there is a gap in bicycle accommodations through the Focus Area. Currently, a shared-use path crosses the Veterans Memorial Bridge and travels south along Route 79 where the path dead-ends at Wellington Street. From here, bicyclists use an on-street bike route to reach President Avenue. Bicyclists are permitted to use Davol Street but there are no dedicated lanes present on these

roadways. Pedestrian access within the Focus Area is primarily limited by Route 79 with the only crossing locations at Central Street and at President Avenue, nearly one mile apart.

It should be noted that none of the intersections studied during the existing conditions analysis provided wheelchair ramps that met current design standards or were fully ADA compliant. In addition, at signalized intersections, while pedestrian signals were provided, no countdown timers were present to warn pedestrians if limited time was available for crossing.

3.2.1 Cedar Street U-Turn

The Cedar Street U-turn, which provides a connection between Davol Street West and Davol Street East, does not provide acceleration or deceleration lanes for northbound and southbound traffic on Davol Street. In addition, the sight distance for vehicles merging with the southbound traffic is somewhat constrained by the vegetation adjacent to the Route 79 embankment and signage to warn drivers of upcoming merging traffic is missing on the southbound side and does not provide adequate advance warning on the northbound side. Improvements at this location that would benefit safety through the U-turn and along Davol Street West and Davol Street East would include trimming back existing vegetation along the Route 79 berm to improve sight distance along Davol Street West. Also along Davol Street West, new pavement markings should be installed to better delineate the lanes of Davol Street West and the stop line along the U-turn, as shown in Figure 3.1.

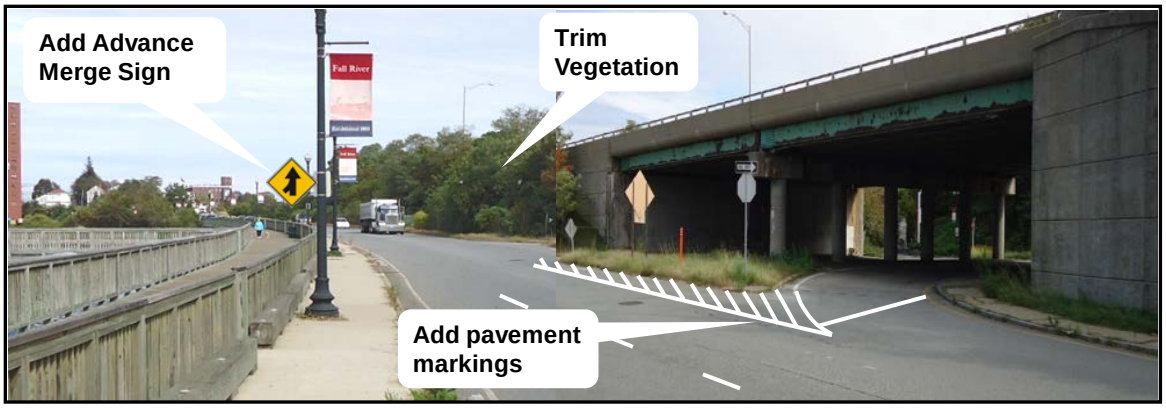


Figure 3.1: Short Term Improvement – Davol Street West at Cedar Street U-Turn

Along Davol Street East, the sign indicating an upcoming merge should be relocated from its current location to a point further upstream of the U-turn that would provide sufficient warning distance, as shown in Figure 3.2.

Figure 3.2: Short Term Improvement –Davol Street East at Cedar Street U-Turn

3.2.2 President Avenue at Davol Street East and Lindsey Street

As discussed in Chapter 2, President Avenue is a four-lane roadway with the intersections of Davol Street East and Lindsey Street roughly 150 feet apart. In order to cross President Avenue, pedestrians must use an unsignalized crosswalk across the westbound right-turn lane of westbound President Avenue. Seventy-three percent of crashes at the President Avenue intersections with Davol Street East and Lindsey Street are rear-end and angle collisions. Based on the proximity of the two intersections, these crashes are possibly caused by poor visibility of traffic traveling to and from Lindsey Street. This traffic must turn through the traffic queue of westbound President Avenue vehicles and across the westbound parking lane. Vehicles along westbound President Avenue may unexpectedly stop to allow Lindsey Street traffic to turn. Similarly, eastbound President Avenue traffic may be required to stop suddenly due to turning traffic. In addition, three collisions involving pedestrians were reported at these intersections, two of which were at the Lindsey Street intersection.

To improve safety for vehicles and pedestrians at these intersections, a "Do No Block Intersection" box should be painted at the intersection with signs placed in advance. An unsignalized crosswalk and ADA compliant ramps should also be added at this intersection with pedestrian signs placed at and in advance of the crosswalk. At the intersection of President Avenue and Davol Street East, accessible pedestrian signals and ramps should be installed across all legs of the intersection. Figure 3.3 shows the developed intersection improvements.

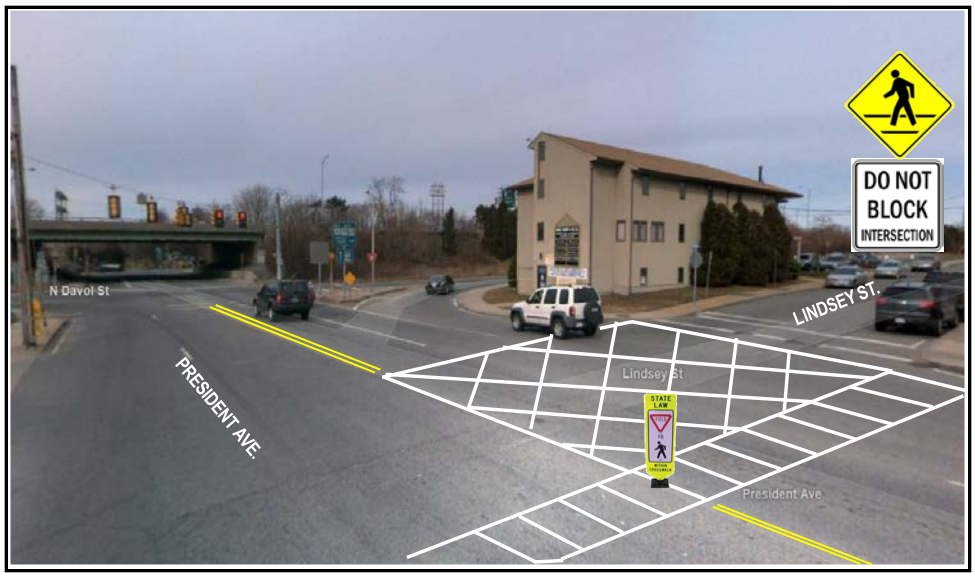


Figure 3.3: Short Term Improvement – President Avenue at Lindsey Street

3.2.3 President Avenue at North Main Street

At this intersection, exclusive left-turn lanes are provided on the eastbound and westbound President Avenue approaches, but not along North Main Street. The traffic signal phasing for this intersection provides permissive left-turn movement for all approaches, but does not provide any protected movements. This may have contributed to the occurrence of angular collisions at the intersection. A potential improvement at this intersection would be to restripe the intersection to add left-turn lanes to the northbound and southbound North Main Street approaches, and upgrade the traffic signal to allow for protected left-turn phasing along both President Avenue and North Main Street. An analysis of the impacts of these changes will be examined in the next chapter.

3.2.4 Lindsey Street at Brownell Street

At this intersection, Lindsey Street is stop-controlled while Brownell Street has a free-flowing movement traveling to and from Davol Street East. Approximately 70% of collisions at this location were angular crashes between vehicles traveling on Brownell Street and southbound Lindsey Street. On the east side of Lindsey Street, homes are built immediately behind the sidewalk limiting sight distance along Brownell Street. The very short distance between Lindsey Street and Davol Street East also creates safety issues at the intersection as Lindsey Street traffic may expect Brownell Street traffic to stop or to not be there at all. Pavement marking should be added at this intersection, emphasizing crosswalks at all approaches and stop lines along Lindsey Street. Additional signing could be placed at the Lindsey Street stop signs, alerting drivers that cross traffic does not stop. In addition, wheelchair ramps should be brought up to current MassDOT and ADA standards at this intersection to provide a safe crossing for pedestrians.

3.2.5 Bicycle Accommodations in the Focus Area

Currently, there is an exclusive bike lane that crosses the Veterans Memorial Bridge and follows Davol Street East for a short distance to its termination at Wellington Street. From here, the bike route connects to President Avenue via Fulton Street and Lindsey Street. No designated bicycle facilities are provided along President Avenue, Davol Street West or Davol Street East. Only sidewalks are present along these roadways. The Regional Transportation Plan proposes the construction of a Fall River Bike Path, but no other bicycle accommodations within the vicinity of the Focus Area exist or are proposed along the waterfront.

The bike route that travels along Fulton Street and Lindsey Street provides access to President Avenue and is currently delineated by green "Bike Route" signs. The City of Fall River has plans to add "sharrow" pavement markings (See Figure 3.4) to the bike routes, which will provide a better defined bike route for all users. The term 'sharrow' comes from the term shared-use arrow, and informs drivers and bicyclists that the roadway should be shared by all users.

Figure 3.4: Short Term Improvement – Sharrows along Bike Route

Bicycle accommodations along Davol Street East and Davol Street West could be improved using one or both of the approaches described below. Under both methods the continuous bicycle route would be comparable to the route identified with "sharrow" pavement markings, but would be more direct and would provided added safety benefit by introducing dedicated bicycle facilities and separating bicycles and motor vehicles. However, both methods would require that the I-195/Route 79 Interchange Project be completed prior to implementation, as the construction limits of the project extend to the Cedar Street U-turn and traffic impacts during construction are anticipated to extend to President Avenue.

3.2.5.1 Bicycle Accommodations along Davol Street through Roadway Restriping

Davol Street West south of President Avenue provides two 11-foot wide travel lanes and an 8-foot wide parking lane. In order to provide on-road bicycle accommodations, the configuration of the roadway would need to be modified within the existing curb-to-curb layout. This would require eliminating one of the travel lanes south of the intersection. However, Davol Street West approaching President Avenue from the north currently has two through lanes, and the westbound President Avenue approach currently has dual left-turn lanes onto Davol Street West. It would be possible to designate an exclusive left-turn lane and a through lane on the Davol Street West approach, but in order to maintain intersection capacity, it is expected that the dual left-turn lane along westbound President Avenue would need to be maintained. Therefore, on Davol Street West, exiting the intersection to the south, two through lanes would need to be extended for a short distance before tapering down to one through lane.

The existing 30-foot width of Davol Street West provides ample space for maintaining the parking lane and one lane for southbound traffic while introducing a minimum 5-foot wide bike lane. See Figure 3.5 for a visualization of this scenario. Pavement markings and signing would be installed along Davol Street West to clearly designate the bike lane. Additionally, near the President Avenue intersection, where bicycle travel would occur near the curb, all drainage grates should be replaced with bicycle-friendly cascade grates.

Figure 3.5: Short-Term Improvement – Davol Street West Bicycle Improvement

Additionally, due to roadway width limitations, 22 parking spaces on Davol Street West would need to be eliminated from President Avenue to shortly before Hathaway Street.

Along Davol Street East, there is currently a 5-foot wide shoulder which is wide enough to accommodate an exclusive bike lane. Northbound bicycle access from the waterfront and from the residential neighborhoods south of President Avenue is possible by restriping the shoulder as shown in Figure 3.6. This improvement could be

implemented between the Cedar Street U-turn and President Avenue. As this improvement would provide bicycle travel in the shoulder of the road, all drainage grates should be replaced with bicycle-friendly cascade grates.

These improvements along Davol Street West and Davol Street East would extend bicycle access from its current terminus at Wellington Street to the Cedar Street U-turn and Heritage State Park, and would also provide full access to the waterfront.

Figure 3.6: Short Term Improvement – Davol Street East Bicycle Lane

3.2.5.2 *Bicycle Accommodations along Davol Street through Partial Reconstruction*

Another improvement option for installing bicycle accommodations on Davol Street would provide a two-way shared-use path for bicycles and pedestrians. The path would be separated from the Davol Street West roadway by a grass buffer. Davol Street would be striped to maintain one lane of southbound traffic and a parking lane along the curb. Reconfiguration of the existing roadway and sidewalk of Davol Street West would be necessary for this improvement, requiring more substantial design and funding.

See Figures 3.7 and 3.8 for an illustration of this scenario, looking south along Davol Street West. The distance between the edge of curb on the left (east) side of the road and the back of sidewalk on the right (west) side along the existing roadway is approximately 37-38 feet. Depending on the exact roadway width which would be confirmed by a survey, Davol Street West could be reconfigured between President Avenue and Heritage State Park to provide a 14 or 15-foot wide travel way (including a 2-foot offset), 8-foot wide parking lane, a 5-foot wide grass strip and a 10-foot wide shared-use path.

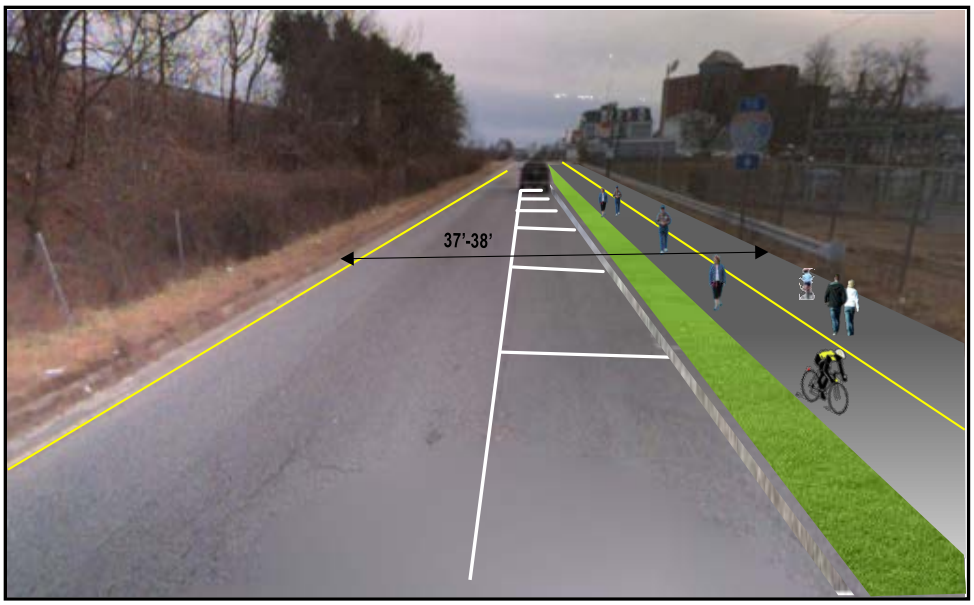


Figure 3.7: Intermediate Improvement – Davol Street West Shared-Use Path

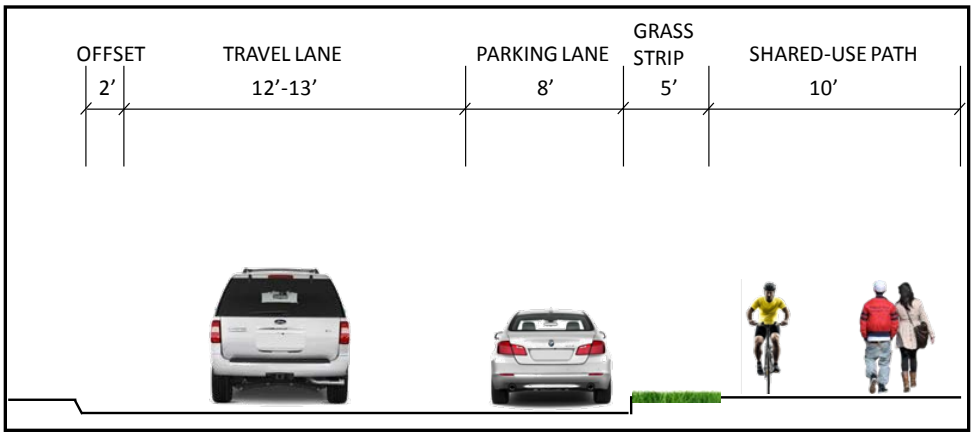


Figure 3.8: Intermediate Improvement – Davol Street West Shared-Use Path Cross-Section

3.3 Improvement Alternatives – A Corridor-Wide Approach

While the improvements discussed for individual locations will provide benefits in safety, local mobility and bicycle access, there remain many issues unaddressed within the Focus Area and Regional Transportation Impact Area. In order to address issues of local connectivity and economic development, it was required to develop alternatives within the Focus Area that reconfigure Route 79, Davol Street West and Davol Street East. By doing this, new east-west connections can be created to connect Fall River neighborhoods to the waterfront, Brightman Street access may be improved, full bicycle and pedestrian access can be constructed, and new parcels can be created for redevelopment.

The development of these improvements for conceptual planning studies is an iterative process that first looks at higher-level concepts in terms of general alignments, approximate number of lanes, new connections, and additional bicycle and pedestrian facilities in order to meet the following objectives:

- Enhance multimodal connectivity between Fall River neighborhoods and the waterfront
- Provide multimodal access to the future South Coast Rail station
- Balance local and regional mobility
- Improve and enhance safety conditions
- Increase opportunities for economic development and land use
- Minimize potential impacts to the environment and community

The alternatives developed can be defined as the following three primary categories:

- Elevated Route 79
- At-Grade Route 79
- At-Grade Route 79 with Frontage Roads.

Within these three categories, various alternatives were developed to be presented to the Working Group for input and feedback. Comments received from the Working Group were used to refine and modify the alternatives with the intent of developing a select number of alternatives to be carried forward and examined in more detail. This analysis enables the alternatives to be compared to each other as well as to the No-Build condition as part of the Alternatives Analysis task, which is presented in Chapter 4.

3.3.1 Alternatives Group 1 – Elevated Route 79 (Limited-Access Highway)

Alternatives Group 1 provides two alternatives that would maintain the existing character of Route 79 as an elevated, limited-access highway which would maintain existing levels of regional mobility. Route 79 would be realigned to the east in both of these alternatives to allow for parcel redevelopment along the waterfront side of Route 79. Additional east-west access and on-road bicycle accommodations would be provided to improve local connectivity between Fall River and the waterfront. East-west connections may also improve multimodal connectivity as direct access would be provided to Fall River Depot Station and SRTA Bus Route 2 service could be expanded to include an additional stop at the planned train station.

3.3.1.1 Alternative 1A – Elevated Route 79

For this alternative (see Figure 3.9), the alignment of Route 79 would be shifted to the east from just north of the Cedar Street U-turn to just south of President Avenue. A two-way east-west connection would be added for access to and from the Fall River Depot Station. On-road bicycle accommodations would be provided from the termination of the existing bike path at Wellington Street and follow Lindsey Street to President Avenue. It would then travel west along President Avenue to Davol Street

West to provide access to City Pier, and also continue south along Davol Street East to provide access to the South Coast Rail station.

3.3.1.2 Alternative 1B – Elevated Route 79 with Cross Connections

Alternative 1B (see Figure 3.10) alignment modifications would begin south of the Cedar Street U-turn and end just south of the Brightman Street U-turn. Two-way east-west connections would be provided at Turner Street Fall River Depot Station driveway, President Avenue, and Cory Street. The Turner Street and President Avenue east-west crossings provide local access to the waterfront along roadways that also have crossings under the railroad. Since Cory Street doesn't cross under the railroad, its access would be limited to neighborhoods west of the railroad. An off-ramp would be provided from northbound Route 79 to Davol Street East south of Cory Street for access to Brightman Street.

Bicycle accommodations would be provided on the same routes as in Alternative 1A. However, in this alternative a 15-foot wide shared-use path would also be provided along Lindsey Street, extending from Wellington Street to Cory Street. The path would then follow Cory Street to Davol Street West where the path would run from Cory Street to the Cedar Street U-turn. In accordance with the new MassDOT Healthy Transportation Policy Directive, sidewalks would be provided along both sides of all new roadways. Davol Street West would be maintained along the alignment of the current Davol Street West as a two-way street within the project limits for access to five new open parcels.

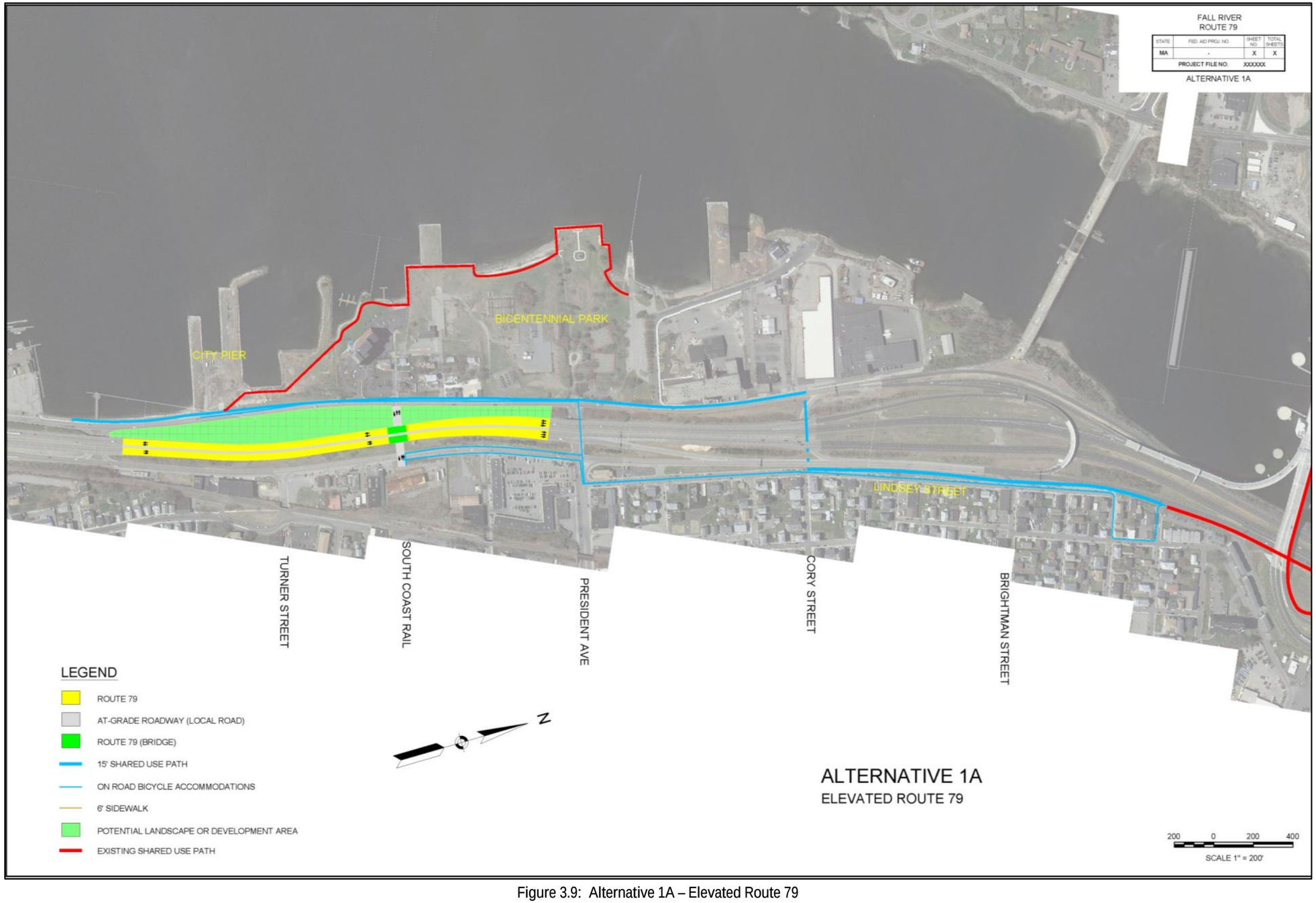


Figure 3.9: Alternative 1A – Elevated Route 79

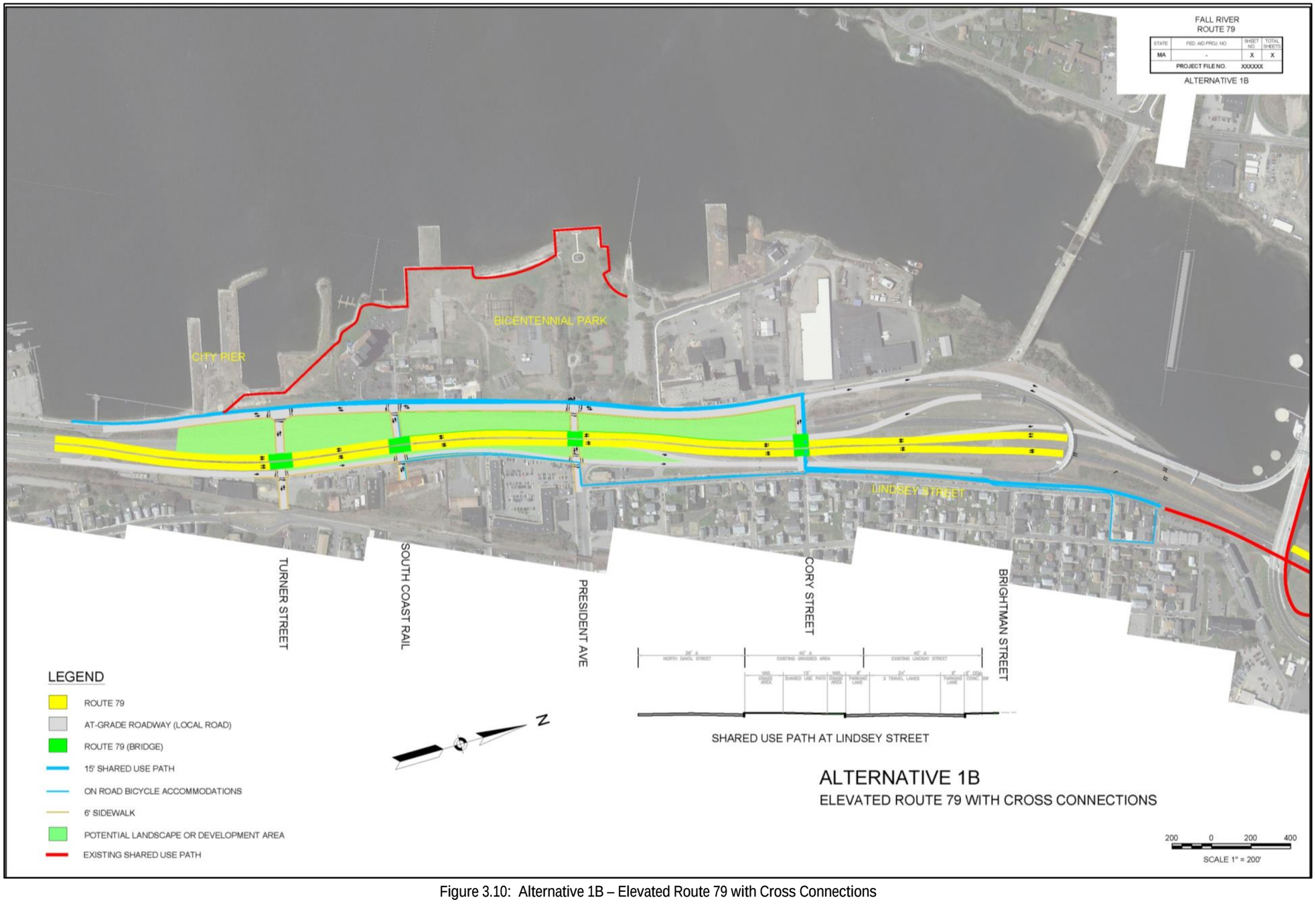


Figure 3.10: Alternative 1B – Elevated Route 79 with Cross Connections

3.3.2 Alternatives Group 2 – At-Grade Route 79 (Urban Boulevard)

Alternatives Group 2 provides three alternatives that would convert Route 79 into an at-grade urban boulevard providing local access and connectivity via intersections along Route 79. The improvement limits of Alternatives 2A, 2B and 2C are similar, beginning south of the Cedar Street U-turn and ending just north of Cory Street. Alternatives 2A and 2B shift Route 79 while maintaining either Davol Street West or Davol Street East. Alternative 2C removes Davol Streets West and East and would rely on interior circulating roads for parcel access.

Each alternative shifts Route 79 to either the west or the east. This allows the creation of parcels focused on waterfront and transit-oriented development. By bringing Route 79 to the elevations of Davol Street West and Davol Street East, local connectivity is greatly improved as all east-west connecting roads have direct access to Route 79. In all alternatives, bicycle accommodations are provided on-road or by means of a 10-foot wide shared-use path.

3.3.2.1 Alternative 2A –Eastern Shift

In Alternative 2A (see Figure 3.11), Route 79 as an urban boulevard would be shifted to the east and aligned where Davol Street East is currently located. North of President Avenue, Route 79 would shift back to its existing alignment with an exit to the existing Davol Street East to maintain Brightman Street access. East-west connections would be provided at Turner Street and President Avenue, roadways that also have grade separated crossings of the railroad. These connections provide access between Fall River and the waterfront. A third east-west connection would be provided at the Fall River Depot Station driveway to provide full access to South Coast Rail.

In this alternative, four new parcels would be created between Route 79 and Davol Street (located along the same alignment as existing Davol Street West). Davol Street West would provide two-way access from Turner Street to Brownell Street. On-road bicycle accommodations would be provided on Lindsey Street from Suffolk Street to President Avenue. At President Avenue, the on-road bike accommodations would be provided along the southbound lanes of Route 79 from President Avenue to their termination at the Fall River Depot Station driveway. A 15-foot wide shared-use path would be provided along Davol Street from President Avenue to City Pier. In accordance with the new MassDOT Healthy Transportation Policy Directive, sidewalks would be provided along both sides of all roadways where shared-use paths would not be provided. SRTA Bus Route 2 is able to maintain its existing route via Route 79 and Davol Street West. A slight modification to this bus route extending it via Davol Street West to Taylor Street where they would be able to turn left onto the new connector roadway would add the Fall River Depot Station to the service of SRTA Bus Route 2.

3.3.2.2 Alternative 2B –Western Shift

In Alternative 2B (see Figure 3.12), Route 79 as an urban boulevard would be shifted to the west. Davol Street would be maintained, but as a two-way road from Turner Street to President Avenue. Davol Street East would be removed south of Brownell Street. An off-ramp from northbound Route 79 to Davol Street East would provide access to Brightman Street. East-west connections would be provided at Turner Street, Fall River Depot Station driveway and President Avenue. Turner Street and President Avenue have grade separated crossings with the railroad and can provide full access between Fall River neighborhoods and the waterfront. The Fall River Depot crossing will provide direct access to South Coast Rail.

A 15-foot wide shared-use path would be provided along the western side of Lindsey Street from Suffolk Street to the Fall River Depot Station driveway and along Davol Street West from President Avenue to City Pier, as well as on-road bicycle accommodations along President Avenue to connect the two paths east to west. In accordance with the new MassDOT Healthy Transportation Policy Directive, sidewalks would be provided along both sides of roadways where shared-use paths are not provided. In this alternative, three parcels would be created for redevelopment east of Route 79 and south of President Avenue. SRTA Bus Route 2 is able to maintain its existing route via Route 79 and Davol Street East. A slight modification to this bus route extending it via Davol Street West to Taylor Street where they would be able to turn left onto the new connector roadway would add the Fall River Depot Station to the service of SRTA Bus Route 2.

3.3.2.3 Alternative 2C –Eastern Shift with Davol Streets Removed

In Alternative 2C, (See Figure 3.13) Route 79 as an urban boulevard would be shifted to the east so that the northbound lanes are located where Davol Street East is currently located. North of President Avenue, Route 79 would shift back to its existing alignment with a northbound off-ramp to the existing Davol Street East to maintain access to Brightman Street. East-west connections would be provided at Turner Street, Fall River Depot Station driveway, and President Avenue. Turner Street and President Avenue have grade separated railroad crossings providing full access between Fall River and the waterfront. The Fall River Depot Station crossing will provide direct access to South Cost Rail and the waterfront.

The existing Davol Street West would end at President Avenue, which would elongate the existing parcels along the riverfront south of President Avenue. Access between these three elongated parcels would be maintained along Route 79 or through internal driveway circulation. On-road bicycle accommodations would be provided along the northbound lanes of Route 79 from the Fall River Depot Station driveway to President Avenue and along the southbound side of Lindsey Street. A 15-foot wide shared-use path would also be provided along the western side of Route 79 from President Avenue

to Cedar Street. In accordance with the new MassDOT Healthy Transportation Policy Directive, sidewalks would be provided along both sides of all roadways. SRTA Bus Route 2 would require some modifications in order to maintain its current route as this alternative does not maintain either Davol Street roadway. A slight modification to this bus route extending it via Davol Street West to Taylor Street where they would be able to turn left onto the new connector roadway would add the Fall River Depot Station to the service of SRTA Bus Route 2.

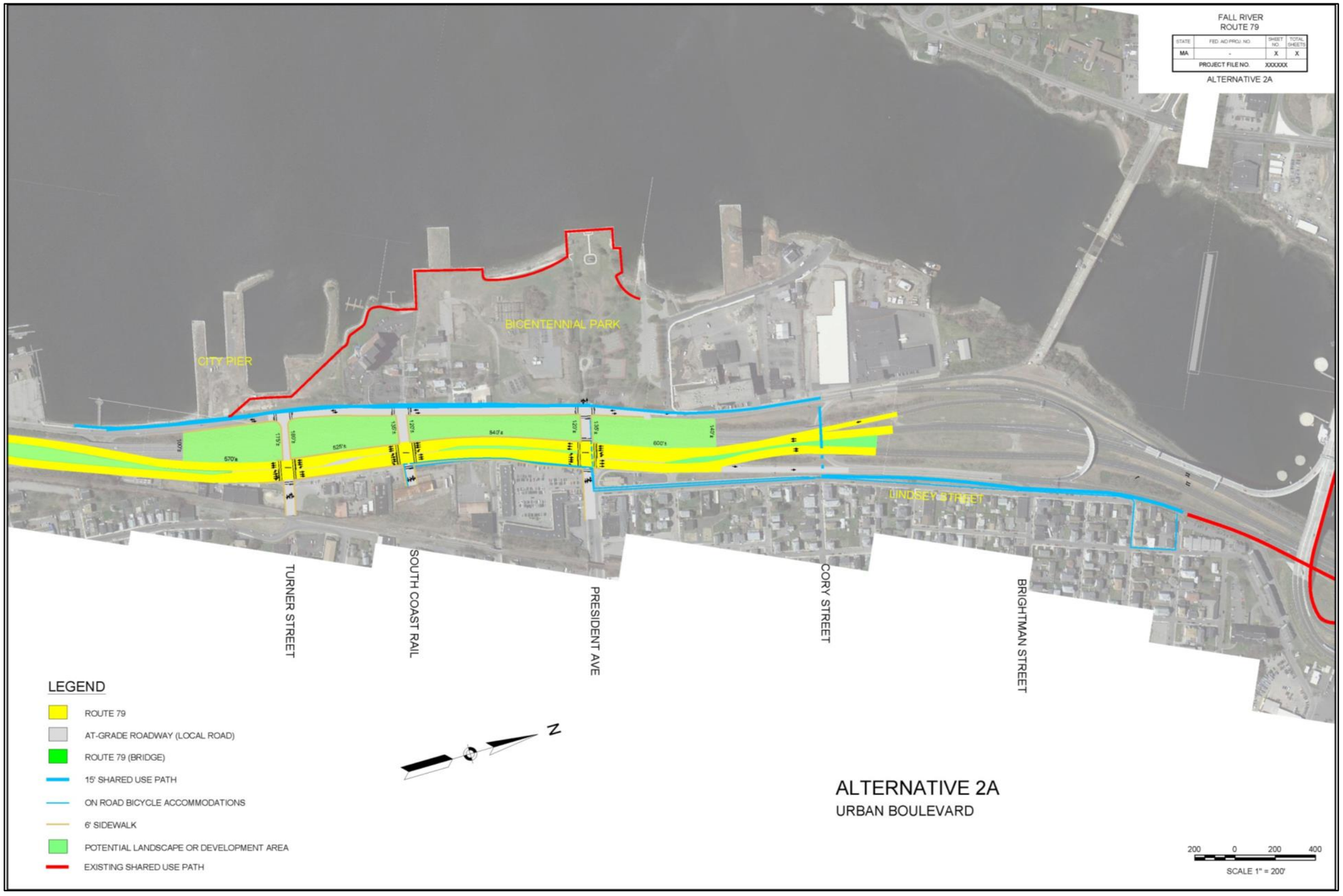


Figure 3.11: Alternative 2A – Urban Boulevard (East Shift)

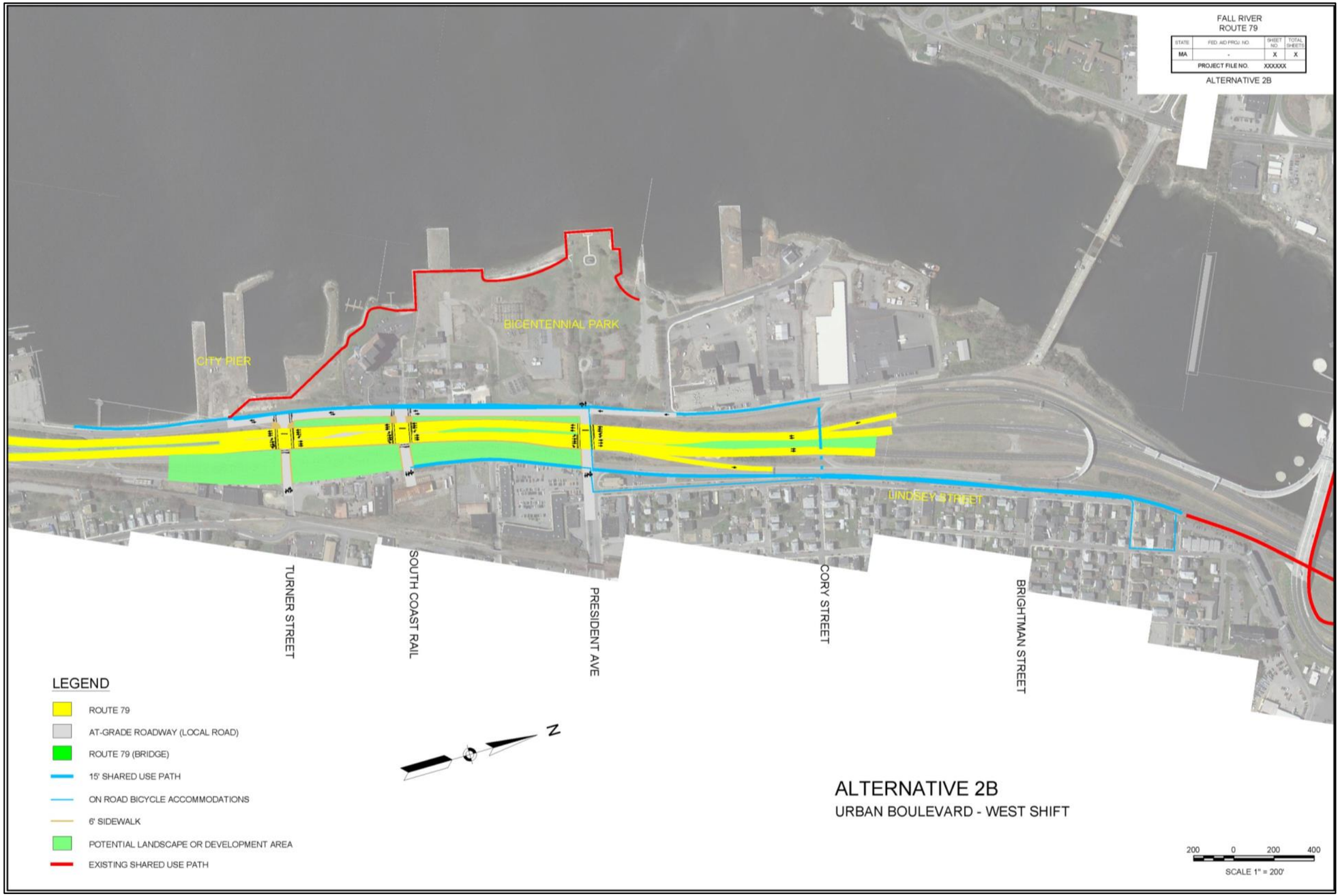


Figure 3.12: Alternative 2B – Urban Boulevard (West Shift)

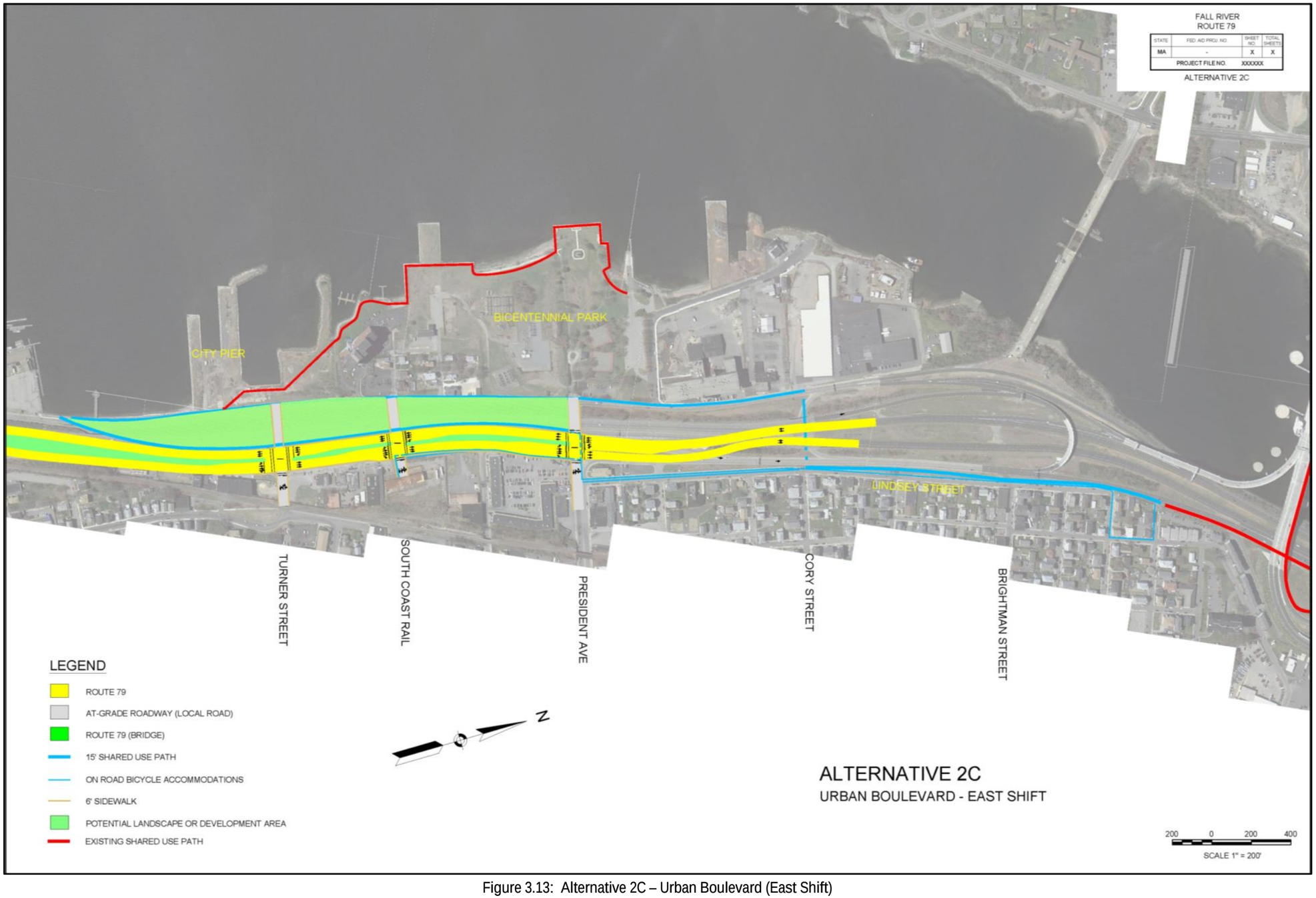


Figure 3.13: Alternative 2C – Urban Boulevard (East Shift)

3.3.3 Alternatives Group 3 – At-Grade Route 79 with Frontage Roads

Alternatives Group 3 provides seven alternatives that would configure Route 79 as an at-grade urban boulevard with intersections along Route 79 providing local access. The primary difference from the Alternatives Group 2 is that the Route 79 mainline would only process through and right-turn movements, and would prohibit left turns. Frontage roads would process local parcel access, as well as northbound and southbound left turns by requiring vehicles to take a right turn and then a left turn onto the frontage roads and then another left turn to cross Route 79. Frontage roads for these alternatives are referred to as Davol Street East or West and may be one-way or two-way depending on the alternative. These alternatives maintain Route 79 as the regional route while Davol Streets East and West are used for all local access and connectivity.

All alternatives would remove the existing Cedar Street U-turn and would be replaced by a new east-west access road in the same location. Bicycle accommodations would be provided as on-road facilities or by means of a 15-foot wide shared-use path.

Various layouts are shown regarding Brightman Street access, and each alternative description below provides more detailed information. Alternatives 3A through 3F maintain existing Brightman Street access. Alternative 3F provides a Brightman Street connection to Davol Streets and Route 79 via Lindsey Street. Alternative 3G converts Brightman Street to a two-way road with direct access to Davol Streets and Route 79.

3.3.3.1 Alternative 3A –Eastern Shift; Two-Way Local Streets

In this alternative, Route 79 would be shifted to the east (see Figure 3.14). Five parcels would be created for redevelopment between Route 79 and the western frontage road, Davol Street West. Davol Street West would be a two-way road along the developable areas, from south of Turner Street to north of Cory Street. Davol Street East would be a two-way frontage road from Turner Street to Cory Street. East-west two-way access would also be provided near Cedar Street, at Turner Street, the Fall River Depot Station driveway, President Avenue and Cory Street. Turner Street and President Avenue cross under the railroad, providing a direct connection between Fall River neighborhoods and the waterfront. The remaining three east-west connections would provide local connectivity between development parcels and the neighborhoods. This alternative maintains the existing Brightman Street access.

A 15-foot wide shared-use path would be provided along the following route: Lindsey Street from Brightman Street to Cory Street; Cory Street from Lindsey Street to Davol Street West; Davol Street West from Cory Street to City Pier. On-road bicycle accommodations would be provided along the remainder of Lindsey Street and along Davol Street East between the Fall River Depot Station driveway and President Avenue. In accordance with the new MassDOT Healthy Transportation Policy Directive, sidewalks would be provided on both sides of all roadways.

3.3.3.2 Alternative 3B –Eastern Shift; One-Way Local Streets

Alternative 3B follows the same alignment as Alternative 3A and would provide the same east-west connections, newly created parcels, and pedestrian and bicycle accommodations (see Figure 3.15). The primary difference with this alternative is that Davol Streets East and West would instead be one-way throughout the project limits similar to Davol Streets West and East are in the existing condition. The east-west roadway connections would also be one-way pairs, with the Cedar Street U-turn connection and Cory Street one-way eastbound while Turner Street and President Avenue would be one-way westbound. Access at the Fall River Depot Station driveway would be a two-way connection.

3.3.3.3 Alternative 3C –Western Shift; Two-Way Local Streets

In this alternative, Route 79 would be shifted to the west to be aligned along Davol Street West (See Figure 3.16). Four parcels would be created between Route 79 and Davol Street East. A fifth parcel would be created between Route 79 and Davol Street West. Davol Street East and West would be two-way roads from Turner Street to Cory Street. East-west two-way access would be provided near Cedar Street, at Turner Street, the Fall River Depot Station driveway, President Avenue and at Cory Street as in Alternative 3A. Bicycle and pedestrian accommodations provided for Alternative 3C would be the same as in Alternatives 3A and 3B.

3.3.3.4 Alternative 3D –Western Shift; One-Way Local Streets

Alternative 3D would follow the same alignment as Alternative 3C and provide the same east-west connections, newly created parcels, and bicycle accommodations (See Figure 3.17). The primary difference is that Davol Streets East and West would be one-way throughout the project limits. For the east-west roadway connections, the Cedar Street U-turn connection would be one-way eastbound and Turner Street would be one-way westbound. The east to west access at the Fall River Depot Station driveway, President Avenue, and Cory Street would be two-way.

3.3.3.5 Alternative 3E –Eastern Shift; One-Way Local Streets Adjacent to Route 79

Alternative 3E would maintain Davol Street East as a one-way road, realign Route 79 to the east along Davol Street East, and also realign Davol Street West (a one-way street) along Route 79. The ramps from southbound Route 79 and U.S. Route 6 to Davol Street West would be realigned to create a two-way east to west connection at Cory Street. Two-way east-west connections would also be provided near Cedar Street, at

Turner Street, Fall River Depot Station driveway, and President Avenue. A continuous 15-foot wide shared-use path would be provided from the termination of the existing bike path, north of the project limits, to City Pier. This alternative would create five parcels for redevelopment, one of them at the eastern end of the Old Brightman Street Bridge. By shifting both Davol Street West and the shared-use path to the east adjacent Route 79, this alternative would allow the parcels on the western side of the corridor to be elongated. See Figure 3.18 for Alternative 3E.

3.3.3.6 Alternative 3F –Brightman Street Connection via Lindsey Street

Alternative 3F is an interchangeable option that would provide access to Brightman Street and could be incorporated into Alternatives 3A through 3E. In this alternative, Davol Street East would end at Cory Street, which would be two-way and would have full access to Route 79. Access to and from Brightman Street could be via Cory Street and Lindsey Street for northbound or southbound access to Route 79. See Figure 3.19 for the Alternative 3F interchangeable option.

3.3.3.7 Alternative 3G –Brightman Street Connection to Northbound Route 79

Alternative 3G is an interchangeable option that provides Brightman Street access and can be used with Alternatives 3A through 3E. In this alternative, Brightman Street access to and from northbound Route 79 would be provided with a direct connection to northbound Route 79. A deceleration lane and acceleration lane would be provided along northbound Route 79 in this alternative. Brightman Street access to southbound Route 79 would make use of the existing U-turn ramp that would take traffic around to Davol Street West or Davol Street West where vehicles could use Cory Street for access to southbound Route 79. Brightman Street access from southbound Route 79 would be provided using the existing off-ramp to Davol Street West and then via Cory Street and Lindsey Street. See Figure 3.20 for the Alternative 3G interchangeable option.

Figure 3.14: Alternative 3A – Eastern Shift; Two-Way Local Streets

Figure 3.15: Alternative 3B – Eastern Shift; One-Way Local Streets

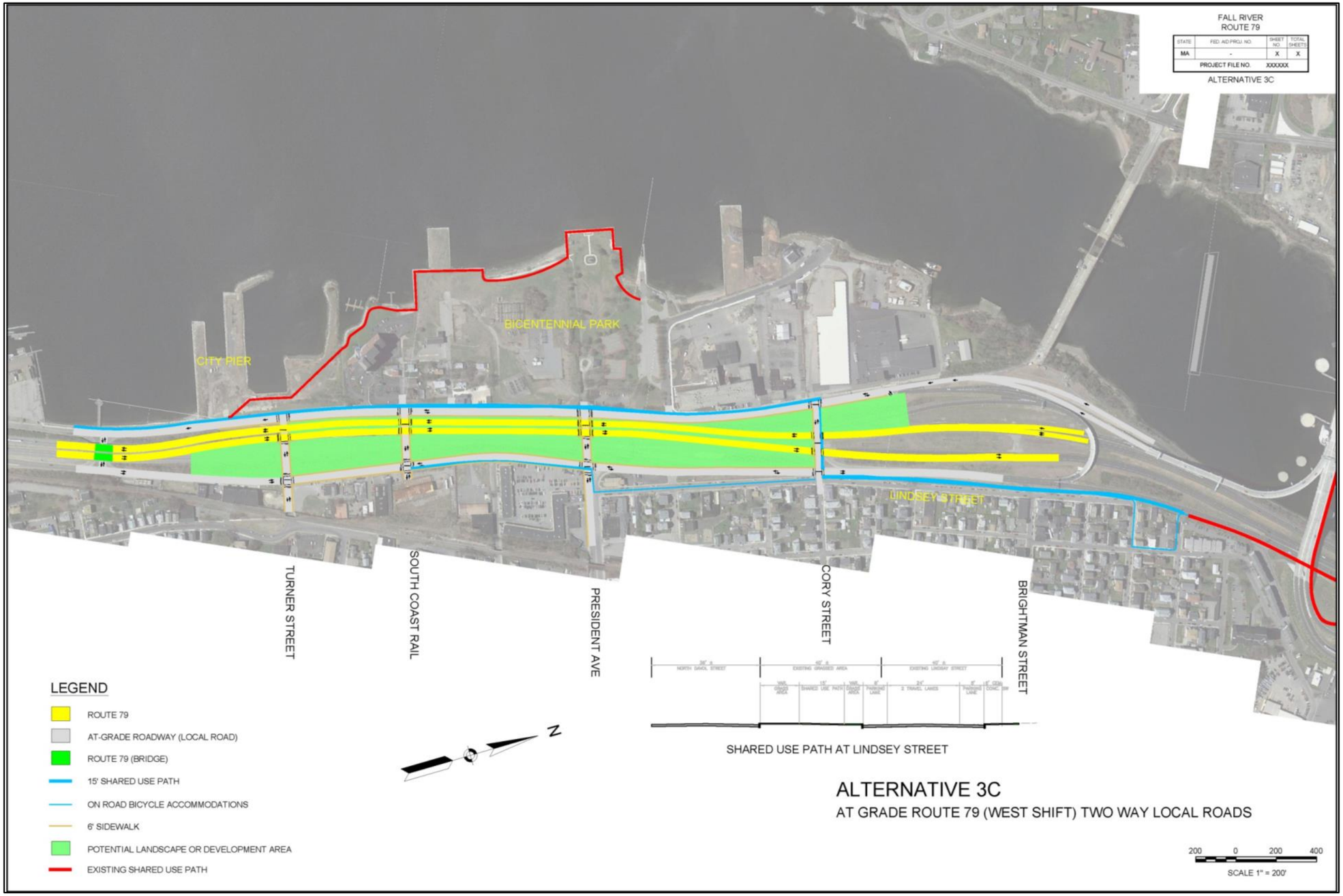


Figure 3.16: Alternative 3C – Western Shift; Two-Way Local Streets

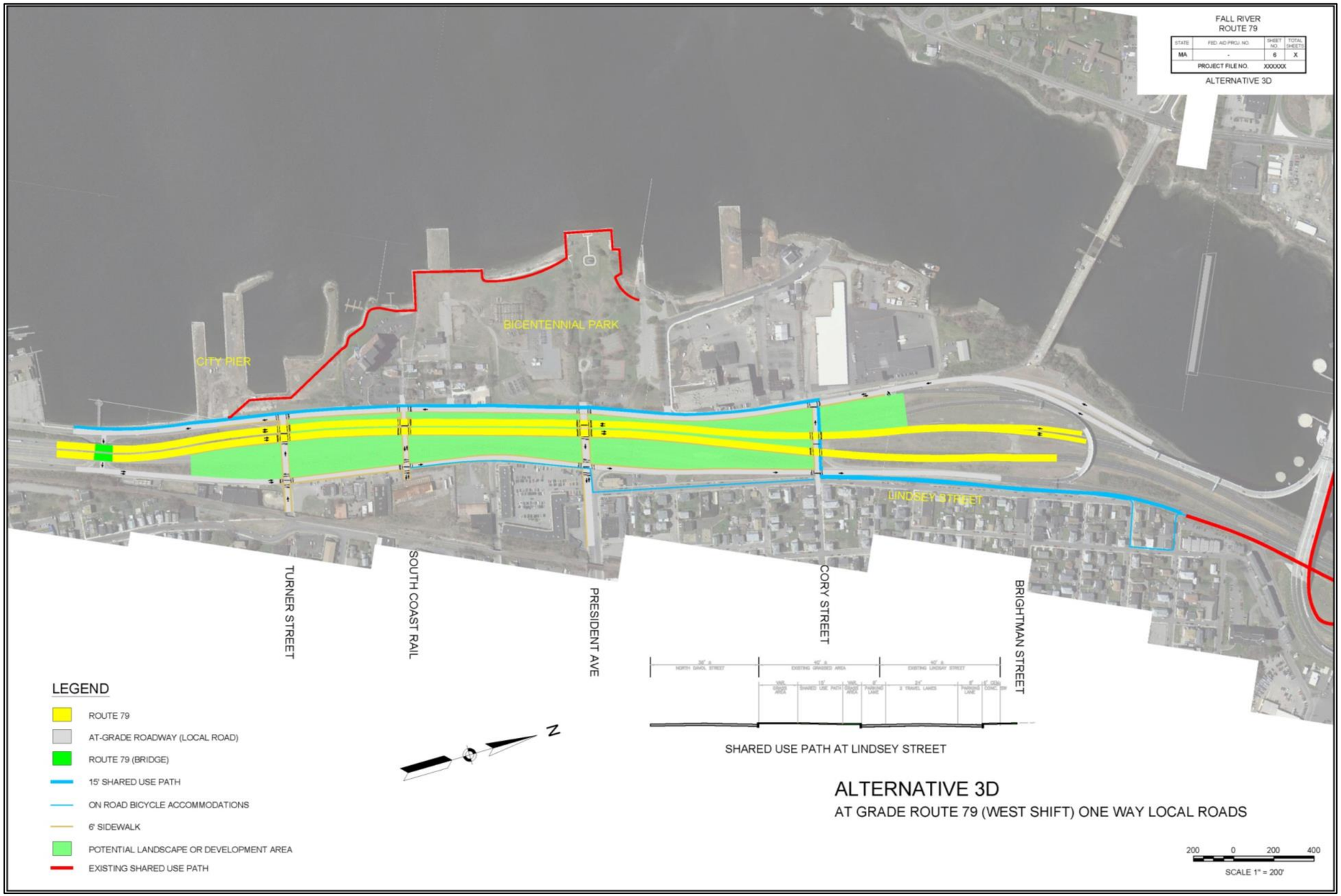


Figure 3.17: Alternative 3D – Western Shift; One-Way Local Streets

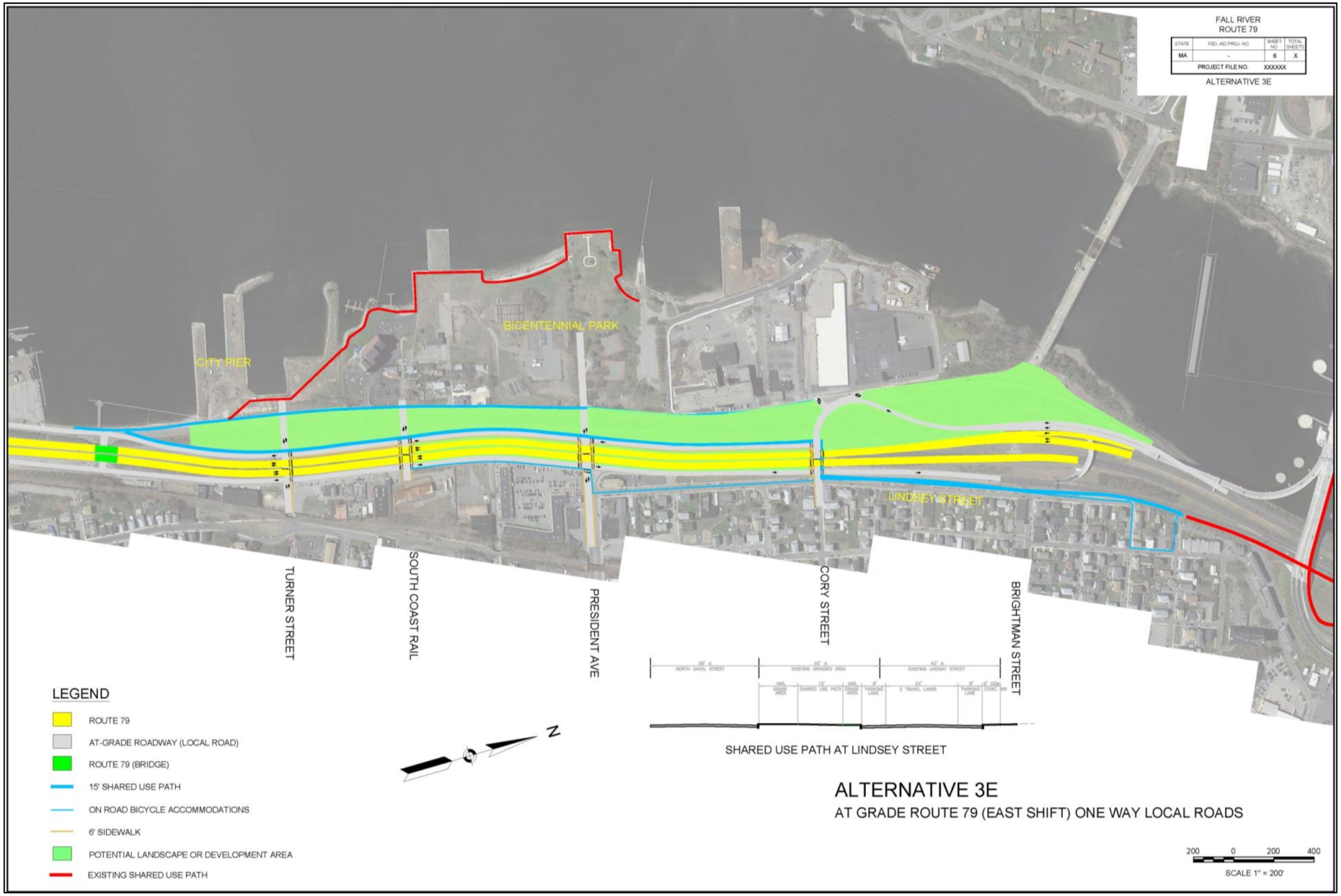


Figure 3.18: Alternative 3E – Eastern Shift; One-Way Local Streets Adjacent to Route 79

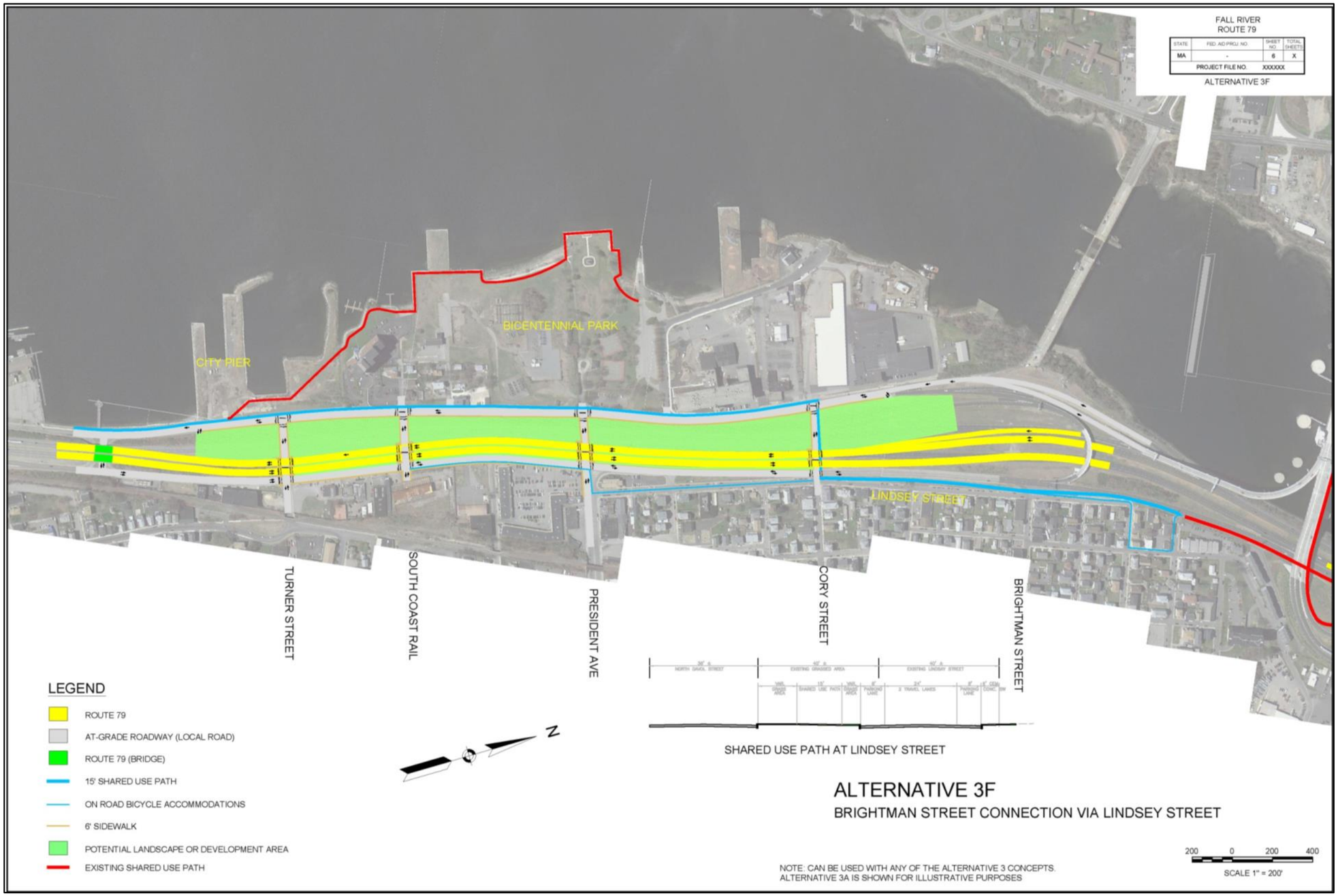


Figure 3.19: Alternative 3F – Brightman Street Connection via Lindsey Street

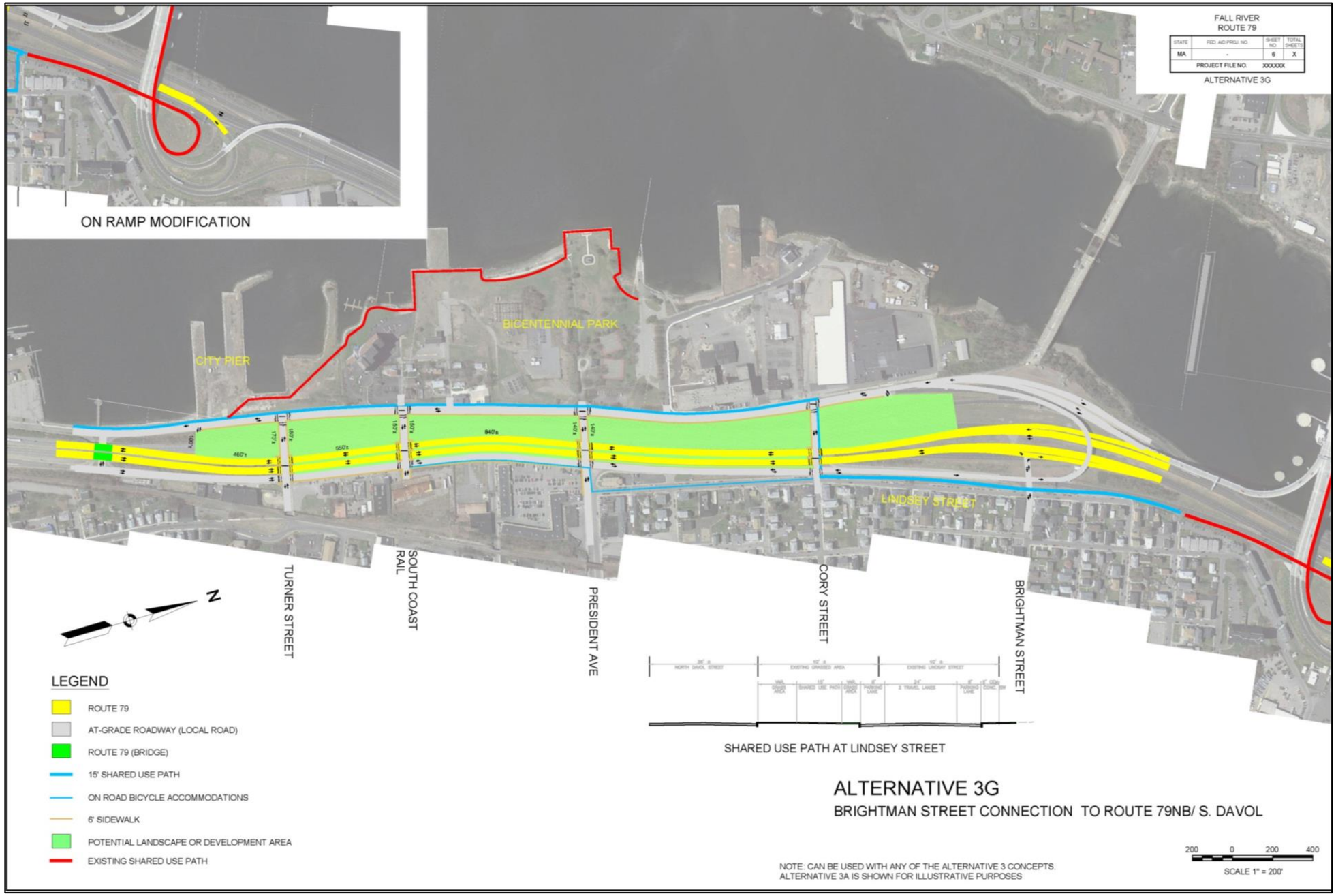


Figure 3.20: Alternative 3G – Brightman Street Connection to Northbound Route 79

3.4 Refinement of Alternatives

On May 29, 2013 a Working Group Meeting was held at the Boys and Girls Club of Fall River to present all improvement alternatives and to solicit input. The Working Group supported all improvements discussed in the location-by-location section as these improvement alternatives are able to provide benefits to safety and access in the near future.

For the corridor-wide alternatives, an eastern shift was preferred for all Alternative Groups. While shifting Route 79 to the west would better support existing businesses on Davol Street East and would provide closer proximity of future transit-oriented development to the Fall River Depot Station, the majority expressed that development of the waterfront properties was preferred, especially since there are already parcels along Davol Street East that could be redeveloped in the future. It was also voiced that east-west connections should be included where feasible, and bicycle accommodations should be expanded to provide extensive access between Fall River and the waterfront, the Fall River Depot Station, and to the old Brightman Street Bridge. Full two-way access should be provided along a western frontage road between the Fall River Depot Station driveway and Brownell Street, and parking should be maintained at all times. Any elimination of parking may limit the accessibility of the waterfront if it is perceived by visitors or patrons that there are reduced parking options.

Most of the working group vocalized a preference that the portion of land just east of the Brightman Street Bridge should be made available for redevelopment. Doing this would require removal of the existing ramps from Route 79 and U.S. Route 6 and demolition of the Brightman Street U-turn Bridge from Davol Street East to Davol Street West that was recently constructed. Other members of the working group felt that recently constructed bridges and roadways from the Veterans Memorial Bridge Project should be incorporated into the project and not removed.

Three alternatives were developed and refined for analysis from the alternative groups. These alternatives offer the best match with the project goals and objectives and respect the Working Group input. The three shortlisted alternatives were then presented to the Working Group on June 27, 2013 for additional input and feedback. The primary changes made to refine these alternatives involved additional provisions for Brightman Street access accommodations, approximating the number of lanes and presence of exclusive turning lanes, and determining the alignment of one-way and two-way roads. All alternatives also provide an east-west connection for pedestrians and motorists north of President Avenue.

3.4.1 Alternative 1 – Elevated Route 79 with Cross Connections

Alternative 1, which was primarily based on Alternative 1B, would maintain an elevated Route 79 but shift the roadway to the east, and also would add east-west underpass connections (See Figure 3.21). Route 79 would provide two lanes in each direction, and would be realigned adjacent to Davol Street East. The Cedar Street U-turn would be maintained, but the Route 79 Bridge over this U-turn would need to be reconstructed due to the roadway realignment. This alternative would provide a narrow median between northbound and southbound Route 79. It

would require construction of new retaining walls along each side of Route 79 to maintain Davol Street East, and to create five new parcels between Route 79 and Davol Street West.

Davol Street East would begin at the off-ramp from northbound Route 79 at the southern project limits and would provide two lanes in the northbound direction. An exclusive northbound left-turn lane would be provided at President Avenue, and a deceleration lane would be provided at the U-turn ramp near Brightman Street. As in the existing condition, an exit ramp to Davol Street East would be provided just north of President Avenue for access to Brightman Street. Brightman Street would be returned to a two-way roadway with a right-in right-out at its intersection with Davol Street East and would allow direct access to and from northbound Route 79 and Davol Street East. Brightman Street traffic traveling southbound would need to use Lindsey Street and Brownell Street to reach Davol Street West.

Davol Street West would carry two lanes in the southbound direction from its beginning near Brightman Street in the north to Turner Street in the south. South of Turner Street, Davol Street West would taper to one southbound lane connecting to the I-195/Route 79 Interchange Project. Parking would be provided along the west side of the roadway. No exclusive turning lanes would be provided along Davol Street West.

Two-way east-west connections would be provided at Turner Street, Fall River Depot Station driveway, President Avenue, and Brownell Street. The existing Cedar Street U-turn and Brightman Street U-turn would be maintained. The east-west access road north of President Avenue is shifted from Cory Street to Brownell Street in this alternative because an intersection at Cory Street and Davol Street East would interfere with the ramp from northbound Route 79. An added benefit of relocating this east-west cross street to Brownell Street is that Brownell Street has a crossing underneath the railroad to the east.

South Coast Rail's Fall River Depot Station would have direct access to both Davol Street East and to Pearce Street. At the station's intersection with Davol Street East, an exclusive through lane (with access to southbound Route 79) and exclusive right-turn lane (with access to northbound Route 79) would be provided. Pearce Street has a right-in right-out at Davol Street East. The intersection of Lindsey Street and President Avenue would be modified by making southbound Lindsey Street dead end prior to President Avenue. Full northbound access to Lindsey Street from President Avenue would be maintained.

A 15-foot wide shared-use path would be provided along the eastern side of Davol Street East from Turner Street to the existing bike path at Wellington Street, and along the western side of Davol Street West from the City Pier to the old Brightman Street Bridge. East-west connections for the shared-use path would be provided along Turner Street, the Fall River Depot Station driveway, and President Avenue. Sidewalks would be provided along the eastern side of Davol Street West and along the east-west connections where shared-use paths are not provided. These include the south sides of Turner Street, Fall River Depot Station, and President Avenue and both sides of Brownell Street.

Currently, the Southeastern Regional Transit Authority (SRTA) Bus Route 2 provides one bus stop within the corridor at Commonwealth Landing. The roadway network provided by

Alternative 1 does not require any changes to this bus route to maintain the single stop at Commonwealth Landing. A slight modification to this bus route extending it via Davol Street West to Taylor Street where they would be able to turn left onto the new connector roadway would add the Fall River Depot Station to the service of SRTA Bus Route 2.

Figure 3.21: Alternative 1

3.4.2 Alternative 2 – At-Grade Urban Boulevard

Alternative 2 is based primarily on Alternative 2A and would change the character of Route 79 to an urban boulevard lowered to an approximate level of Davol Street East and President Avenue. It would have a wide median for landscaping, and would provide local access to the waterfront and Route 79 via new intersections (See Figure 3.23). The infrastructural changes for this alternative would begin just south of Cedar Street and extend to the on-ramp from Davol Street East to U.S. Route 6. The Route 79 alignment would follow the current alignment of Davol Street East and would provide three lanes in each direction, with the exception of southbound direction south of Turner Street, which would be reduced to two lanes to meet interchange project alignment. The U-turn near Cedar Street would be eliminated since it is no longer needed: connection between Davol Street East and Davol Street West in this area would be accomplished via the newly introduced east-west cross streets, namely Turner Street and the Fall River Depot Station/Taylor Street connector. The added benefit of eliminating this U-turn would be ability to lower Route 79 profile. Figure 3.22 conceptually illustrates how this revised profile would tie into the I-195/Route 79 Interchange Project. The Brightman Street U-turn from northbound to southbound Davol Street would be maintained.

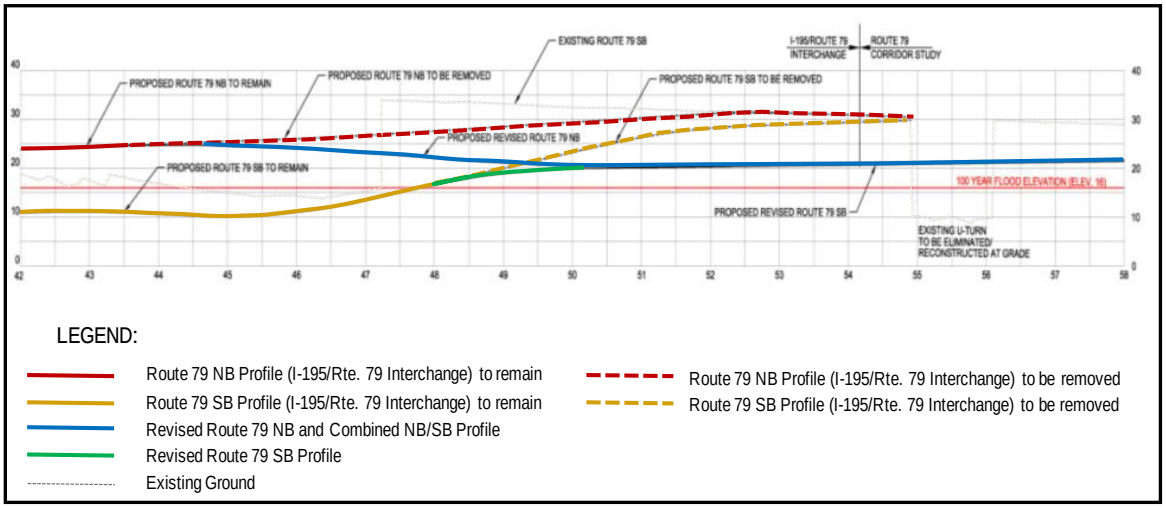

EXISTING ROUTE 79 SB
I-195/ROUTE 79 INTERCHANGE
ROUTE 79 CORRIDOR STUDY
PROPOSED ROUTE 79 NB TO REMAIN
PROPOSED ROUTE 79 NB TO BE REMOVED
PROPOSED ROUTE 79 SB TO BE REMOVED
PROPOSED REVISED ROUTE 79 NB
PROPOSED ROUTE 79 SB TO REMAIN
100 YEAR FLOOD ELEVATION (ELEV. 16)
PROPOSED REVISED ROUTE 79 SB
EXISTING U-TURN TO BE ELIMINATED/ RECONSTRUCTED AT GRADE
LEGEND:
Route 79 NB Profile (I-195/Rte. 79 Interchange) to remain
Route 79 SB Profile (I-195/Rte. 79 Interchange) to remain
Revised Route 79 NB and Combined NB/SB Profile
Revised Route 79 SB Profile
Existing Ground
Route 79 NB Profile (I-195/Rte. 79 Interchange) to be removed
Route 79 SB Profile (I-195/Rte. 79 Interchange) to be removed

Figure 3.22: Alternative 2 Lowered Route 79 Profile

This alternative would remove Davol Street East but maintain Davol Street West as a two-way frontage road that would follow the alignment of the current Davol Street West. By eliminating Davol Street East, the off-ramp from northbound Route 79 to Davol Street East near Cedar Street would need to be removed. At the northern project limits near the interchange of U.S. Route 6 with Route 79, the ramp configuration to westbound U.S. Route 6 would need to be modified. Currently, the ramp to U.S. Route 6 comes from Davol Street East. In the proposed configuration, the ramp would need to be realigned to depart from northbound Route 79.

Exclusive turn lanes would be provided at all east-west cross streets (Turner Street, Fall River Depot Station driveway, President Avenue and Cory Street) and all cross streets would also be two-way roads. Turner Street and Cory Street would provide one lane in each direction, while the Fall River Depot Station driveway connection would provide one lane eastbound and two

lanes westbound. Fall River Depot's parking lot would also have right-in right-out access to northbound Route 79 via Pearce Street. President Avenue would provide two lanes in each direction. In the westbound direction, dual left-turn lanes would be provided along with an exclusive through lane and an exclusive right-turn lane. Southbound Lindsey Street would be dead-ended just before President Avenue. Elimination of the conflict between southbound Lindsey Avenue and President Avenue traffic would not only improve vehicular safety at this high crash location, but would also make it safer for pedestrians crossing President Avenue mid-block. Right turns from westbound President Avenue to northbound Lindsey Street would be maintained.

Access between Brightman Street and Route 79 would be reinstated. The existing constraint of the Brightman Street/Davol Street East intersection located in the immediate proximity to the U-turn ramp, created during construction of the Veterans Memorial Bridge, would be eliminated and this ramp would serve exclusively Brightman Street traffic. In the northbound direction, the right lane of Route 79 would become a right-turn only lane to Brightman Street. West of Lindsey Street, westbound Brightman Street would become an on-ramp to northbound Route 79, forming a third through lane that would become an exit-only lane to U.S. Route 6 at the Veterans Memorial Bridge. Westbound Brightman Street would also provide access to southbound Route 79 by using the U-turn ramp from Brightman Street to Davol Street West and then turning left onto Cory Street for right-turn access to Route 79. From southbound Route 79, vehicles destined for Brightman Street eastbound can turn left onto Cory Street and take Lindsey Street to Brightman Street.

Davol Street West would be formed by the three ramps from eastbound U.S. Route 6, southbound Route 79 and the Brightman Street U-turn Ramp. The U-turn Ramp and the Route 79 ramp would then merge to form one lane while the ramp from U.S. Route 6 would form a second lane. South of Cory Street, these two lanes merge to form one lane southbound to the southern limits of the Focus Area. Davol Street West would provide one lane in the northbound direction within the project limits. No exclusive turn lanes would be provided on the east-west connector roads. Parking would be provided on both sides of Davol Street West.

A 15-foot wide shared-use path would be provided along the eastern side of northbound Route 79 from Turner Street to the existing bike path at Wellington Street, and along the west side of Davol Street West from City Pier to the Brightman Street Bridge. East to west connections for the shared-use path would be provided along Turner Street, the Fall River Depot Station driveway, and along President Avenue. Sidewalks would be provided along the eastern side of Davol Street West, the western side of Route 79, and along the east to west connections where shared-use paths would not be provided.

Currently, the Southeastern Regional Transit Authority (SRTA) Bus Route 2 provides one bus stop within the corridor at Commonwealth Landing. The roadway network provided by Alternative 2 would slightly modify the bus route by detouring buses to Route 79 towards the intersection with Cory Street where they would turn left and head towards Davol Street West, where they would rejoin the current route. An additional stop at Fall River Depot could also be added to the Route's service by extending it to Taylor Street.

Figure 3.23: Alternative 2

3.4.3 Alternative 3 – At-Grade Route 79 with Frontage Roads

Alternative 3 is based on a combination of Alternatives 3B, 3E and 3G and would lower Route 79 to the same elevation as Davol Street East and President Avenue, and realign it adjacent to Davol Street East. It would also provide frontage roads on either side of Route 79 for local access and to process left-turn movements off of northbound and southbound Route 79 by requiring vehicles to take a right turn off Route 79, a left turn onto the frontage road and then a left turn onto a cross street to continue eastbound or westbound. This alternative would begin south of Cedar Street and extend to the ramp from Davol Street East to U.S. Route 6. See Figure 3.24 for a graphic of this alternative. This alternative would also create a sixth additional parcel by removing the existing Brightman Street U-turn and realigning the ramps to free up the land just east of the Brightman Street Bridge.

In this alternative, Route 79 would provide two lanes in each direction and would remove both the Brightman Street and Cedar Street U-turns. No exclusive turn lanes are provided along Route 79, Davol Street West or Davol Street East in this alternative. The east-west cross streets (Cedar Street, Turner Street, Fall River Depot Station driveway, President Avenue and Cory Street) provide only shared lanes at their intersections with Davol Street West, Route 79 and Davol Street East. The east-west cross street near Cedar Street, Turner Street and the Fall River Depot Station driveway are one-way roads. Turner Street is one-way westbound while Cedar Street and the Fall River Depot Station driveway are one-way eastbound. The Fall River Depot station driveway's westbound approach to the intersection with Davol Street East and Route 79 provides one eastbound lane for traffic traveling to Fall River Depot and two westbound lanes providing a left-turn only lane and a right-turn only lane. Fall River Depot has a second driveway onto Pearce Street which has a right-in right-out onto Davol Street East. The east-west cross streets at President Avenue and Cory Street will be two-way. Cory Street will provide one lane in each direction while President Avenue will provide two lanes in each direction.

South of Cedar Street, an off-ramp from northbound Route 79 would form Davol Street East, which would be a one lane frontage road providing local access to the waterfront and Fall River. Davol Street East would end just north of President Avenue where it would end as a right-turn only onto Brownell Street. Because Davol Street East does not extend beyond this point, the ramp to westbound U.S. Route 6 would need to be modified to exit from Route 79 as discussed previously in this section. As in Alternatives 1 and 2, southbound Lindsey Street would be dead-ended just north of President Avenue to remove the southbound to eastbound movements. However, right turns from westbound President Avenue to northbound Lindsey Street would be maintained.

Access between Brightman Street and Route 79 would be improved. In the northbound direction, a right-turn only lane would be added along the right lane of northbound Route 79 which would allow turns onto eastbound Brightman Street. West of Lindsey Street, westbound Brightman Street would become an on-ramp to northbound Route 79, forming a third through lane that would become an exit only lane to U.S. Route 6 at the Veterans Memorial Bridge. Brightman Street vehicles would be able to access southbound Route 79 by taking Lindsey

Street southbound to Cory Street, and then turn left onto Route 79. Brightman Street traffic traveling southbound on Route 79 would exit to Davol Street West, turn left onto Cory Street and take Lindsey Street northbound to Brightman Street.

The ramps from eastbound U.S. Route 6 and southbound Route 79 would be realigned to be as close to Route 79 as possible. Two of the ramps would merge to form one lane that has a T-intersection with Davol Street West. Realigning these ramps would create a parcel near the Brightman Street Bridge for redevelopment but would require that the recently constructed Brightman Street U-turn Bridge be removed.

A 15-foot wide shared-use path would be provided along the eastern side of Davol Street East from Turner Street to the existing bike path at Wellington Street, and along the western side of Davol Street West from City Pier to the Brightman Street Bridge. East-west connections for the shared-use path would be provided along Turner Street, the Fall River Depot Station driveway, and along Cory Street. Sidewalks would be provided along the eastern side of Davol Street West and along the east-west roadway connections where shared-use paths would not be provided.

Currently, the Southeastern Regional Transit Authority (SRTA) Bus Route 2 provides one bus stop within the corridor at Commonwealth Landing. The roadway network provided by Alternative 3 would slightly modify the bus route by detouring buses to Route 79 towards the intersection with Cory Street where they would turn left and head towards Davol Street West, where they would rejoin the current route. An additional stop at Fall River Depot could also be added to the Route's service by extending it to Taylor Street.

Figure 3.24: Alternative 3

3.4.4 Additional Community and Working Group Input

Through coordination with the Working Group and input received at the Public Informational Meetings, it was suggested that the following considerations be reviewed as part of alternatives development. All of these concepts are geographically located near the northern end of the Focus Area and were evaluated at a basic, feasibility level to determine whether they could be included in any of the analyzed alternatives.

3.4.4.1 Provide Sixth Parcel for Redevelopment in Alternative 2

It was discussed during Working Group meetings that it would be desirable to be able to redevelop the land immediately east of the Old Brightman Street Bridge. Alternative 3 would provide a roadway and ramp layout that makes this redevelopment possible. Alternative 3 removes the Brightman Street U-turn, which allows the ramps from Route 79 and U.S. Route 6 to be realigned along southbound Route 79 before tying into Davol Street West at a T-intersection. This realignment creates a sixth parcel for redevelopment immediately east of the Old Brightman Street Bridge.

North of Cory Street, the roadway layout of Alternatives 2 and 3 would be interchangeable. Alternative 2 would create a large parcel north of Cory Street and would maintain the existing ramp configurations from Route 79 and U.S. Route 6. This layout exists because the Brightman Street U-turn ramp would be maintained in this alternative. If this ramp is removed as is shown in Alternative 3, the Route 79 and U.S. Route 6 ramps are able to be realigned, creating a sixth parcel at the Old Brightman Street Bridge. The U-turn ramp is not able to be maintained while realigning the Route 79 and U.S. Route 6 ramps because the new ramp locations would conflict with the existing bridge abutment and pier. The Brightman Street U-turn ramp was recently constructed in 2010 as part of the Veterans Memorial Bridge Project. It would be possible to modify Alternative 2 to incorporate the Route 79 and U.S. Route 6 ramp realignment if removal of the Brightman Street U-turn ramp is determined to be feasible during the permitting process.

3.4.4.2 Provide a Pedestrian Bridge over Route 79

In the Working Group and Public Information Meetings, it was requested to consider feasibility of providing a pedestrian bridge over Route 79 as part of the project. A pedestrian bridge would connect the existing Fall River neighborhoods to the waterfront and would span Davol Street East, Route 79, and possibly Davol Street West. In order to be ADA accessible, the approaches to the pedestrian bridge must provide switchback ramps or elevators to the bridge. The ramps would have a total length of approximately 300 feet. Chapter 4 contains further discussion of feasibility of adding a pedestrian bridge.

3.4.4.3 Convert the Brightman Street U-Turn Ramp to a Pedestrian Bridge

In the Working Group and Public Informational Meetings, it was questioned whether it would be feasible to convert the existing Brightman Street U-turn ramp into a pedestrian bridge over Route 79. This would provide pedestrian and bicycle access from the Brightman Street area to the old Brightman Street Bridge and the waterfront. Chapter 4 contains further discussion of feasibility of this modification.

3.4.5 Federal Highway Administration Review

In December 2013, the Federal Highway Administration (FHWA) reviewed Alternatives 1, 2 and 3 in order to provide input on the alternatives development process. Through this review, it was recommended that Alternative 2 be modified to provide a narrower cross-section and smaller intersections along Route 79. It was also recommended that Davol Street West be removed or shortened. From this input, Alternative 2 – Modified was developed. See Figure 3.25 for a graphic of this alternative.

Alternative 2 – Modified was based on Alternative 2 with the following changes:

- The Route 79 mainline was reduced from three lanes to two lanes in each direction.
- Davol Street West would be a two-way road from President Avenue to the ramps from Route 79 and Route 6, and between Baylies Street and Hathaway Street. These sections of roadway would provide a continuation of Route 6 and would maintain full access to Commonwealth Landing, Bicentennial Park, the Point Gloria Condominiums, and properties off Hathaway Street.
- Through movement along Davol Street West was terminated south of President Avenue, with isolated segments of the former access road being maintained to provide access to existing parcels and businesses.

With a reduced cross-section, pedestrian and bicycle travel time across Route 79 will be reduced. The smaller intersections along Route 79 will improve the visibility of pedestrians and bicyclists and the reduced overall pavement width of Route 79 would aesthetically provide a more pedestrian friendly environment within the corridor. It is anticipated that the reduced cross-section of Route 79 will cause some degradation in traffic operations within the Focus Area.

Figure 3.25: Alternative 2 – Modified

Route 79 / Davol Street Corridor Study

Chapter 4

Alternatives Analysis

4.1 Analysis of Alternatives

In Chapter 3, multiple alternatives were discussed for implementation within the Focus Area. Some alternatives focused on specific intersections within the Focus Area while others presented a corridor-wide alternative. Of the individual intersection alternatives, some required that additional analysis be completed in order to determine how the safety improvements might impact the operation of the intersections. These intersections include:

- President Avenue at Davol Street East
- President Avenue at North Main Street

Analyses of the corridor-wide alternatives are also provided in this chapter. These analyses take into account the reconfiguration of Route 79, Davol Street West, and Davol Street East as well as future traffic volumes and development that may occur within newly created parcels in the Focus Area as a result of the roadway reconfigurations.

4.2 Intersection Analysis – President Avenue at Davol Street East

At this intersection, while there are no existing issues related to capacity or congestion, there are issues related to safety. In Chapter 3, it was discussed that a pedestrian signal should be installed across the right-turn lane of westbound President Avenue. Table 4.1 provides the operational analysis for this intersection. Current (2012) traffic and pedestrian volumes were used for this analysis because this safety improvement could be implemented in the short-term as it required limited funding and design.

Table 4.1: Operations Analysis at the Intersection of President Avenue and Davol Street East

Location	AM Peak Hour					PM Peak Hour				
	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue
Existing Conditions										
Intersection	B	18.3	0.56			B	19.7	0.61		
NB Left/Through	B	19.5	0.57	79	128	C	21.9	0.75	142	233
NB Right	C	33.7	0.82	125	215	C	26.0	0.76	147	242
EB Left/Through	A	8.1	0.28	61	122	B	10.6	0.34	70	141
WB Through	B	18.3	0.46	91	112	C	21.7	0.55	94	109
WB Right	B	16.6	0.13	1	14	B	19.8	0.24	30	97
Intersection Improvement – Addition of Signalized Pedestrian Crossing										
Intersection	B	18.3	0.56			B	19.7	0.61		
NB Left/Through	B	19.5	0.57	75	125	C	21.9	0.75	127	207
NB Right	C	33.7	0.82	114	204	C	26.0	0.76	133	232
EB Left/Through	A	8.1	0.28	56	94	B	10.6	0.34	69	119
WB Through	B	18.3	0.46	67	94	C	21.7	0.55	73	95
WB Right	B	16.6	0.13	47	77	B	19.8	0.24	68	97

As can be seen in Table 4.1, it is not anticipated that the addition of a signalized pedestrian crossing across the westbound President Avenue right-turn lane will impact the operations of the intersection. The queue in the westbound right-turn only lane is only expected to get a few car lengths longer.

4.3 Intersection Analysis – President Avenue at North Main Street

Similar to the previous intersection, President Avenue at North Main Street does not experience any existing issues related to capacity or congestion. However, there are issues related to safety. In Chapter 3, it was discussed that in order to reduce the number of angle collisions occurring at this location, exclusive left-turn lanes should be striped along North Main Street and the traffic signal controller should be upgraded to provide exclusive left-turn phases for both roadways. Table 4.2 provides the operational analysis for this intersection. Current (2012) traffic and pedestrian volumes were used for this analysis because this safety improvement could be implemented in the short-term as it requires limited funding and design.

Table 4.2: Operations Analysis at the Intersection of President Avenue and North Main Street

Location	AM Peak Hour					PM Peak Hour				
	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue
Existing Conditions										
Intersection	C	22.4	0.79			C	27.2	0.83		
NB Left/Through/Right	C	24.7	0.75	158	271	C	33.3	0.81	236	414
SB Left/Through/Right	B	19.8	0.62	127	238	C	21.3	0.49	134	237
EB Left	B	13.8	0.14	32	125	B	16.6	0.22	78	306
EB Through/Right	C	26.6	0.82	211	347	C	31.9	0.85	283	501
WB Left	B	14.8	0.20	16	42	B	17.9	0.26	18	58
WB Through/Right	B	15.6	0.39	92	168	B	19.0	0.47	135	241
Intersection Improvement – Addition of Signalized Pedestrian Crossing										
Intersection	C	21.0	0.69			C	23.8	0.76		
NB Left	B	19.3	0.39	59	138	C	20.6	0.48	92	200
NB Through/Right	C	34.1	0.78	150	298	D	43.1	0.86	195	385
SB Left	B	19.5	0.39	59	120	B	19.4	0.29	39	87
SB Through/Right	C	25.7	0.60	106	206	C	27.6	0.64	112	212
EB Left	A	9.2	0.10	58	278	A	9.0	0.16	223	654
EB Through/Right	B	18.8	0.74	270	490	C	22.7	0.83	419	697
WB Left	B	10.6	0.10	15	41	B	10.9	0.13	15	41
WB Through/Right	B	12.3	0.35	98	188	B	13.0	0.46	132	243

As can be seen in Table 4.2, it is not anticipated that the addition of exclusive left-turn phases will significantly impact intersection operations. Queue lengths will increase on almost all approaches, but overall, the traffic signal would operate at an acceptable level of service for all approaches.

4.4 Final Alternatives for Analysis

Four final alternatives were developed and refined based on preliminary planning, engineering, and Working Group input. In order to determine how each alternative meets the study goals and objectives, the following process was completed for during analysis:

- Determine development mix for parcel redevelopment
- Determine maximum allowable development size for each alternative
- Determine number of trips generated for each parcel based on maximized redevelopment
- Perform initial sensitivity analysis to identify development thresholds
- Forecast travel demand for the Regional Transportation Impact Area based on development thresholds
- Perform Regional Transportation Impact Area and Focus Area operational analysis
- Develop Evaluation Matrix for all alternatives

An additional alternative, Alternative 2 – Modified was developed based on FHWA input and review. This review and the subsequent development of Alternative 2 – Modified did not occur until December 2013, after analyses of Alternatives 1, 2 and 3 were completed. In order to provide analysis, it is assumed that the process completed for Alternative 2 is valid for Alternative 2 – Modified with the exception of the Focus Area operational analysis and the evaluation matrix. These assumptions are discussed in greater detail further in this chapter.

4.5 Proposed Development Mix and Maximum Build-Out Potential

All of the corridor-wide alternatives will create five or six parcels for redevelopment along the west side of Route 79. To determine the maximum build-out for each alternative, the development mix was based on the Waterfront and Transit Oriented District (WTOD) zoning regulations that govern the Waterfront District as well as the existing character and density of the surrounding area. The concept for the newly created parcels was agreed upon by the City of Fall River and conforms to the 2009 Fall River Master Plan and the 2002 Harbor Plan. The Harbor Plan calls for the waterfront development to be a vibrant entertainment, restaurant, hotel and retail district serving increased vehicular and pedestrian traffic that would be facilitated by the Route 79 / Davol Street Corridor Study. The initial development scenario, the Maximum Potential Build-Out, is calculated based on the maximums allowed by the District's Transit Oriented Development zoning, as follows:

- Maximum Building Height: 6 stories or 80 feet (12 stories or 150 feet by special permit)
- Maximum Lot Coverage: 80%
- Minimum Parking Requirements:
  - Retail: No dedicated parking
  - Office: 1 space per 200 square feet (< 10,000 square feet); 1 space per 1,000 square feet (> 10,000 square feet)
  - Residential: 1.5 spaces per unit (< 50 units); 1.25 spaces per unit (> 50 units)
- Mixed Use Developments: 30% reduction in parking if over 200 spaces

It was assumed that the maximum building height would be five stories, matching that of Commonwealth Landing. Within each building, it is assumed that the first floor would be used for retail, restaurant and entertainment uses, while the second floor would be office space. The remaining three floors would be devoted to residential units, with a mix of apartments and condominium units. Parking would be provided in structures or in surface lots. Remaining open space would be used for parks, stormwater management and environmental mitigation.

These assumptions conform to the Fall River Master Plan and the vision presented in the Harbor Plan, which called for 200,000 to 300,000 square feet of office space and a 150 to 200 room hotel.

The Maximum Physical Build-Out that is permitted by the WTOD zoning varies for each of the alternatives with the size of the parcels created by each alternative. Table 4.3 shows the number and size of development parcels for each alternative. Alternative 2 – Modified is included in this table for reference. Because the cross section of Route 79 is reduced to two lanes in each direction in this alternative, parcel sizes created by Alternative 2 – Modified are comparable to those created by Alternative 3.

Table 4.3: Parcel Sizes by Alternative

Alternative	Parcel Areas (acres)						
	1	2	3	4	5	6	Total
Alternative 1 – Elevated Route 79	2.2	1.8	1.4	0.6	4.1	N/A	10.1
Alternative 2 – At Grade Route 79	1.4	1.4	1.3	2.3	4.2	N/A	10.6
Alternative 2 – Modified	3.3	1.9	2.2	2.6	4.6	N/A	14.6
Alternative 3 – At Grade Route 79 with Frontage Roads	2.2	2.1	2.1	3.0	2.2	3.5	15.0

Table 4.4 shows the maximum development potential for each alternative assuming the previously described 5-story mixed use development. The values provided in the table account for the maximum lot coverage and parking requirements of each land use type. As can be seen in the table, Alternative 1 has the lowest maximum development potential while Alternative 3 has the greatest maximum development potential. This is due to the roadway network and number of lanes provided in each alternative.

Table 4.4: Maximum Development Potential

Type of Area		Maximum Physical Build-Out	
	Alternative 1	Alternative 2	Alternative 3
Total Parcel Area	10.1 acres	10.6 acres	15.0 acres
Land Use			
Retail	265,900 SF	280,000 SF	398,200 SF
Residential	797,700 SF	840,100 SF	1,194,600 SF
Office	265,900 SF	280,000 SF	398,200 SF
Total Developable Area	1,329,500 SF	1,400,100 SF	1,991,000 SF

The Maximum Development Potential must be adjusted such that it does not exceed the capacity of Fall River to absorb the assumed volume of floor space. This is referred to as the Maximum Build-Out Allowable by Regional Market Conditions. The ability of the regional property market to absorb the potential volume of uses was estimated based on the growth forecasts for population, households, and employment that are contained in the Central Transportation Planning Staff (CTPS) Travel Demand Model for the time period between 2010 and 2035. The estimate of the maximum development supportable within the region based on its anticipated growth over the next 20 years is shown in Table 4.5.

Table 4.5: Maximum Regional Build-Out Allowable by Regional Market Conditions

Land Use	Maximum Development Supportable by 2035 Metropolitan Planning Organization Forecast
Retail	268,000 SF
Residential	9,719,000 SF
Office	442,000 SF
Total Developable Area	10,428,000 SF

Residential development has the highest potential within the region given the economic and demographic growth forecasts, and it far exceeds the amount of residential space that any of the alternatives can provide. Retail development is the most constrained, with the region anticipated only to be able to absorb 268,000 square feet over the 25 year forecast period. The future demand for office space is expected to be sufficient to support the levels of office space allowable by zoning under each alternative.

4.6 Trip Generation and Initial Sensitivity Analysis

While the proposed development area must not exceed anticipated regional development levels, it must also be able to be supported by each alternative's proposed roadway network. In order to determine the approximate number of lanes along Route 79, frontage roads and east-west connections, the trips generated to and from each new parcel must be approximated. Trip generation was determined per

parcel for all alternatives using the Institute of Transportation Engineers' (ITE) Trip Generation Manual (9th Edition).

The Trip Generation Manual generates trips entering and exiting parcels based on specific land use types. The parcels developed by each alternative are considered multi-use developments. Multi-use developments have at least two specific land use types that can be accessed without using external roadways such as Davol Street or Route 79. Trips were generated for each parcel based on the square footage of retail and office space and on the number of residential units. These total trips were then reduced by an estimated number of internal trips.

Residential units are classified under Land Use 220 of the Trip Generation Manual. This land use, Apartment, includes buildings with at least four dwelling units. Office space is classified under Land Use 710 – General Office Building and includes all buildings with a mixture of tenants. Retail space is classified under Land Use 814 – Specialty Retail Center. This land use pertains to small shopping centers providing a variety small retail shops, services and small restaurants.

Trips were generated using the maximum developable area for each alternative, providing the maximum number of trips that could enter and exit each parcel. For the initial sensitivity analysis, the most critical intersections were studied using generated trips, Future No-Build traffic volumes and an assumed roadway configuration. These intersections were along U.S. Route 6 (President Avenue) between Davol Street West and Davol Street East. The Future No-Build traffic volumes were applied to each alternative and redistributed as necessary based on the roadway configuration of each alternative. For the sensitivity analysis, it was assumed that some through traffic currently on Route 79 between I-195 and U.S. Route 6 would divert from Route 79 to Route 24. An iterative process was completed at the U.S Route 6 intersections that involved adjusting the number of lanes on Route 79 and Davol Streets, varying the level of through trips diverted from Route 79 to Route 24 and by adjusting the trips traveling to and from the parcels. This was done by applying a percentage to the through traffic volumes and to the trips generated under maximum development which would reduce the overall trips traveling to and from the parcels and, as a result, the intersections. This process continued until a roadway configuration, percentage of through traffic and percentage of trips from maximum development would result in an acceptable level of service at each critical intersection.

Once the final percentage of trips from maximum development was known, this percentage was applied to the development at all parcels for that alternative, providing approximate volumes of traffic entering and exiting the parcels and ballpark development areas for each alternative. After completion of the sensitivity analysis and final revision of the alternatives, trip generation numbers and roadway network information was provided to CTPS for use in generation of the build models for Alternatives 1, 2 and 3. Table 4.6 provides the development data supportable by each alternative. The final alternatives provided to CTPS for modeling are shown in Figures 4.1 through 4.3. For reference, Alternative 2 - Modified is included as Figure 4.4.

Table 4.6: Maximum Development Supportable by Route 79 Alternatives

	Alternative 1	Alternative 2	Alternative 3
Total Parcel Area	10.1 acres	10.6 acres	15.0 acres
Development Area (assumes 5 story buildings)	1.3 Million SF	1.2 Million SF	0.3 Million SF
Parking Requirements	960 spaces	877 spaces	296 spaces
Open Space within Parcels	2.5 acres	3.7 acres	13.4 acres

The sensitivity analysis showed that Alternative 1 required only minor changes along Northbound and Davol Street Wests in order to accommodate the maximum level of development. It requires that two lanes be provided in each direction along Route 79.

Alternative 2 was assumed to provide 3 lanes in each direction along Route 79 with exclusive left-turn lanes at all intersections and exclusive right turn lanes at Fall River Depot and President Avenue. One lane in each direction is provided along the two-way Davol Street West. The sensitivity analysis showed that with this configuration, Alternative 2 could provide slightly less than the maximum level of development but would likely cause some diversions across the Veterans Memorial Bridge through Somerset.

Alternative 3 was assumed to provide 2 lanes in each direction along Route 79 with right turns only allowed from Route 79. Davol Street East and Davol Street West each provide one lane. Restricting turning movements from Route 79 creates complicated traffic signal phasing along Route 79 and the Davol Street East frontage road, leading to poor capacity at these intersections. The sensitivity analysis showed that Alternative 3 could not support the maximum level of development. Development levels for this alternative were significantly reduced to provide some development while avoiding substantial diversions through Somerset. An alternative to this was to increase the number of lanes along Route 79 to three lanes in each direction. This was determined to not be a feasible option as it would reduce the overall developable area by introducing a large amount of new pavement, greatly increase pedestrian crossing times and would not provide a meaningful improvement to local and regional traffic operations.

It is assumed that the trip generation numbers and maximum development determined for Alternative 2 is applicable to Alternative 2 – Modified. While Alternative 2 – Modified provides a greater total parcel area, the reduced cross section of this alternative limits the amount of additional traffic that the intersections can process. Alternative 2 – Modified does not have the complicated traffic signal phasing that Alternative 3 has, so the intersections of Alternative 2 – Modified are anticipated to operate similar to those of Alternative 2 but with slightly higher delays, longer queues and worse levels of service.

Figure 4.1: Final Alternative 1 Used for Analysis

Figure 4.2: Final Alternative 2 Used for Analysis

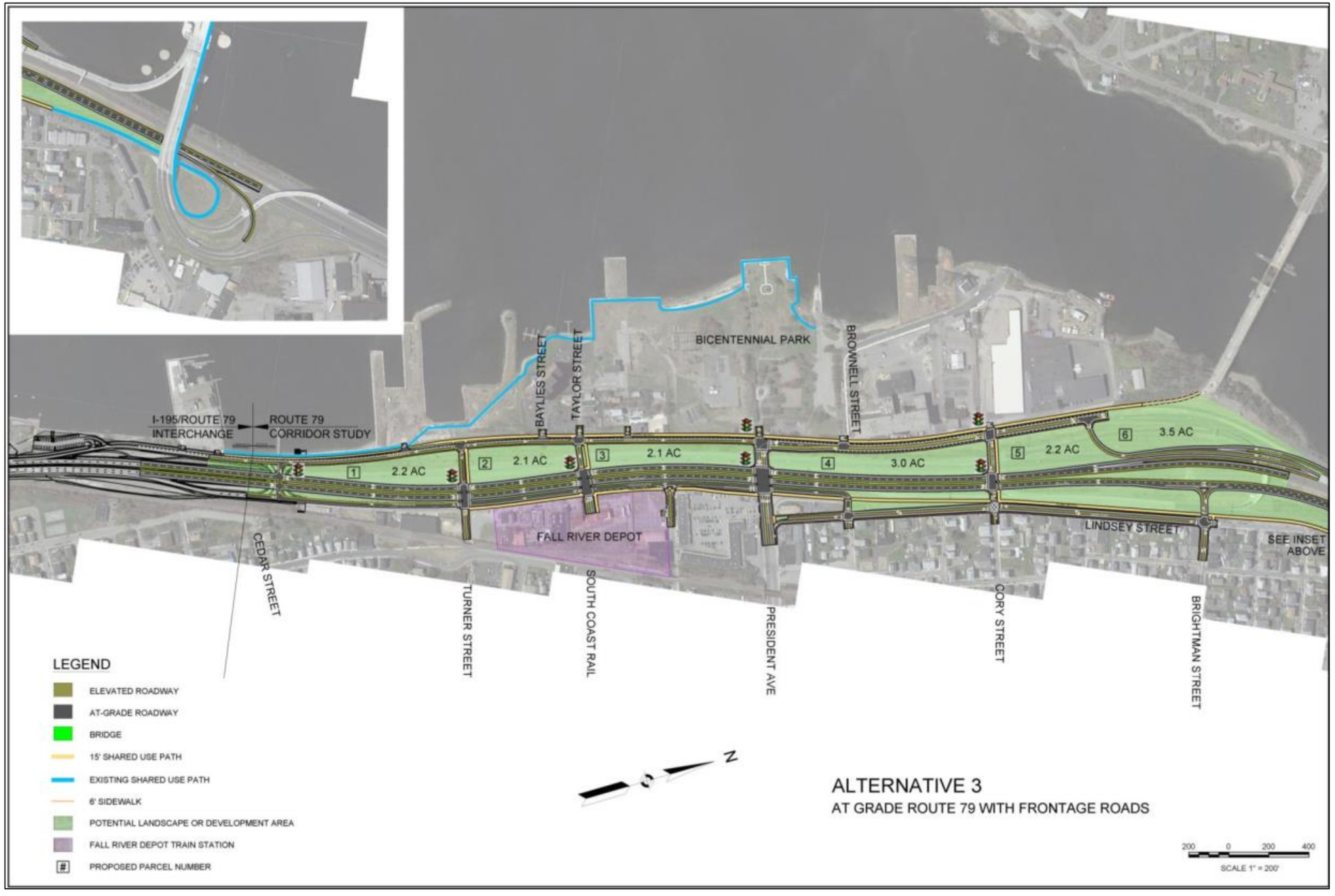


Figure 4.3: Final Alternative 3 Used for Analysis

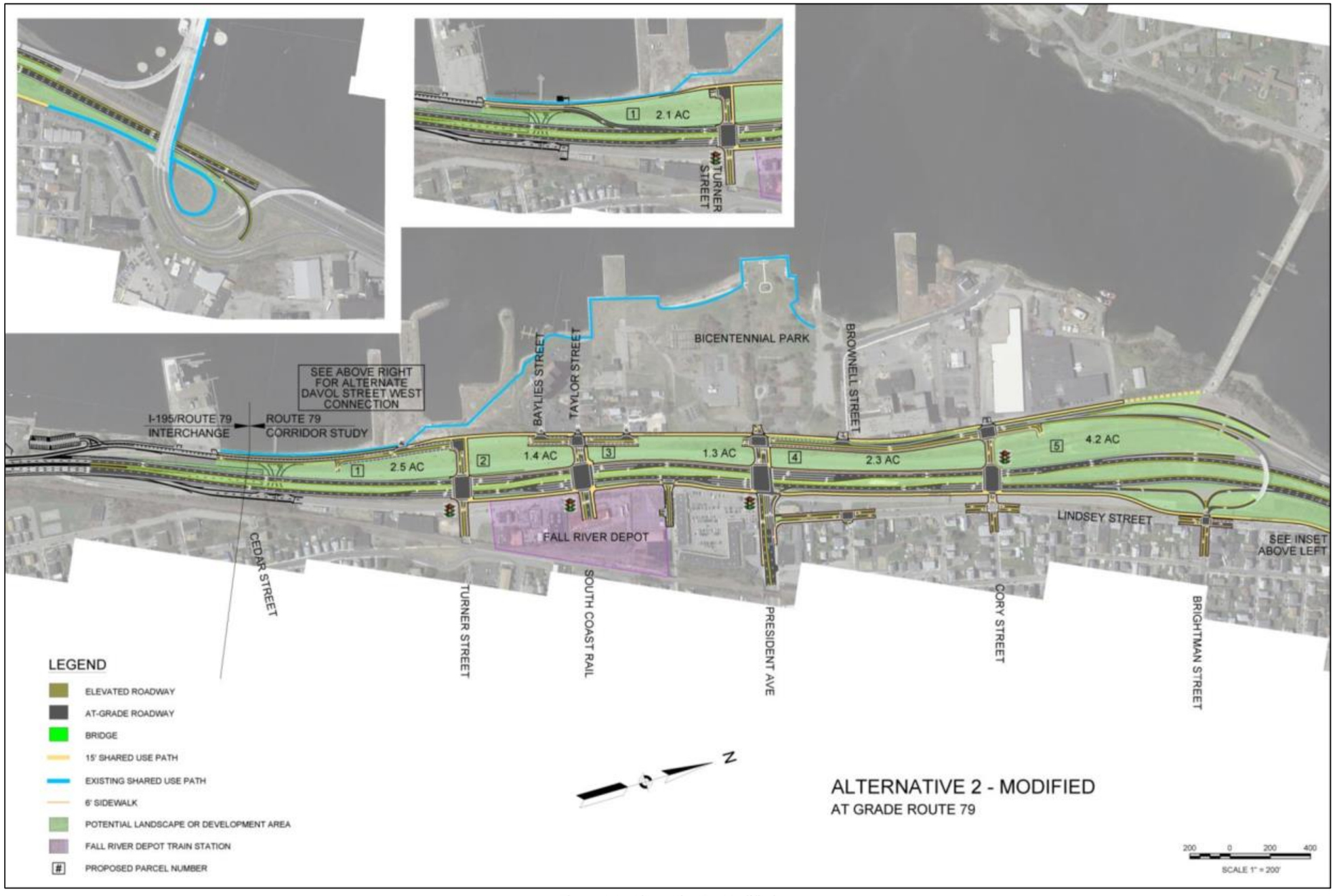


Figure 4.4: Alternative 2 – Modified

4.7 Forecast Travel Demand and Operational Analysis

CTPS incorporated the trip generation numbers developed during the sensitivity analysis into their 2035 regional model for Alternatives 1, 2 and 3, dividing the number of trips into the appropriate Transportation Analysis Zone (TAZ) depending on the location of the parcel within the corridor. The regional model determines the volume of traffic traveling through the Focus Area and Regional Traffic Impact Area during three hour long AM and PM peak periods. The trips traveling to and from individual TAZs were broken down and redistributed to the appropriate parcels. The volumes throughout the Focus Area and Regional Transportation Impact Area were converted to peak hour volumes and underwent a final refinement to account for turning movements and local roads that are not included in the CTPS model but are necessary for analysis of the alternatives. The traffic volumes were analyzed and compared to the Future No-Build Alternative in Chapter 2. Table 4.7 on the next page provides a summary of traffic volumes within the Focus Area just south of President Avenue for the Future No-Build Conditions and for three Route 79 Alternatives.

4.7.1 2035 Alternative 1 Traffic Volumes

Figures 4.5 through 4.7 show the Traffic Volume Exhibits for Alternative 1. This alternative allows for greater amounts of east-west traffic between Fall River and the waterfront and a high amount of north-south traffic along Route 79. Traffic volumes within the Regional Transportation Impact Area and along Route 79 through the corridor remain essentially unchanged versus the Future No-Build condition in both the AM and PM Peak Hours. Traffic along Davol Street West is significantly increased by roughly 500 vehicles due to the new developments; however east-west traffic is now distributed across the four connecting roads. No diversions are anticipated with this alternative.

4.7.2 2035 Alternative 2 Traffic Volumes

Figures 4.8 through 4.10 show the Traffic Volume Exhibits for Alternative 2. Similar to Alternative 1, this alternative allows for greater amounts of east-west traffic between Fall River and the waterfront. This alternative eliminates Davol Street East, providing direct access between Route 79 and the Fall River neighborhoods along North Main Street at 4 locations. This shifts traffic whose destination is Fall River onto Route 79. Traffic along the two-way Davol Street West is limited to traffic accessing the existing and future developments along the waterfront and traffic from U.S. Route 6. Diversions are anticipated through Somerset between I-195 and Route 79, generally following a path along Lee's River Avenue and U.S. Route 6 across the Veterans Memorial Bridge. Approximately 300 vehicles are diverted in the eastbound direction and 200 vehicles in the westbound direction. Within the Regional Transportation Impact Area, but outside of the corridor and the diversion path, no changes to traffic volumes versus the Future No-Build are anticipated.

As previously discussed, it was determined that the trip generation numbers developed for Alternative 2 will apply for Alternative 2 – Modified. Similarly, the Alternative 2 traffic volumes

generated in the CTPS travel demand model in the Regional Transportation Impact Area are considered to be accurate for those occurring under Alternative 2 – Modified, as it was assumed that the two alternatives will experience similar levels of development, diverting similar levels of traffic through Somerset. Within the Focus Area, traffic volumes generated in the travel demand model were redistributed based on the proposed roadway network of Alternative 2 - Modified. Figure 4.11 shows the Alternative 2 – Modified Traffic Volume Exhibit within the Focus Area.

4.7.3 2035 Alternative 3 Traffic Volumes

Figures 4.12 through 4.14 show the Traffic Volume Exhibits for Alternative 3. Similar to the previous alternatives, Alternative 3 allows for greater amounts of east-west traffic between Fall River and the waterfront. This alternative provides a mix of Alternatives 1 and 2. Northbound and Davol Street Wests are maintained. Local access is greatly improved as direct access to Northbound and Southbound Route 79 is provided at Turner Street, South Coast Rail, President Avenue and Cory Street. Route 79 is able to turn right onto local roads, but no left turns are allowed. Traffic on Route 79 wishing to access an east-west roadway or Davol Street on the left side of the road must exit Route 79 near Cedar Street or near the U.S. Route 6 interchange. As Route 79 now has multiple access points to the waterfront and Fall River, some traffic has shifted from traveling on Northbound or Davol Street West to traveling on Route 79. This alternative will cause diversions in Somerset along the same path as in Alternative 2. Approximately 200 vehicles are diverted in the eastbound direction and roughly 100 vehicles are diverted in the westbound direction. Outside of the corridor and the diversion path, no changes to traffic volumes versus the Future No-Build are anticipated.

Table 4.7: Traffic Volumes within the Focus Area Just South of President Avenue

Traffic Location	Future No-Build	Alternative 1	Alternative 2	Alternative 2 Modified	Alternative 3
AM Peak Hour					
Northbound Route 79	1,082	1,134	972	994	1,366
Southbound Route 79	1,047	1,081	1,774	1,818	1,431
Davol Street East	739	716	22	N/A	175
Davol Street West	743	1,239	44	N/A	169
PM Peak Hour					
Northbound Route 79	1,057	1,079	1,703	1,785	1,646
Southbound Route 79	1,417	1,410	2,030	2,070	1,740
Davol Street East	1,013	1,164	82	N/A	167
Davol Street West	938	1,239	39	N/A	136

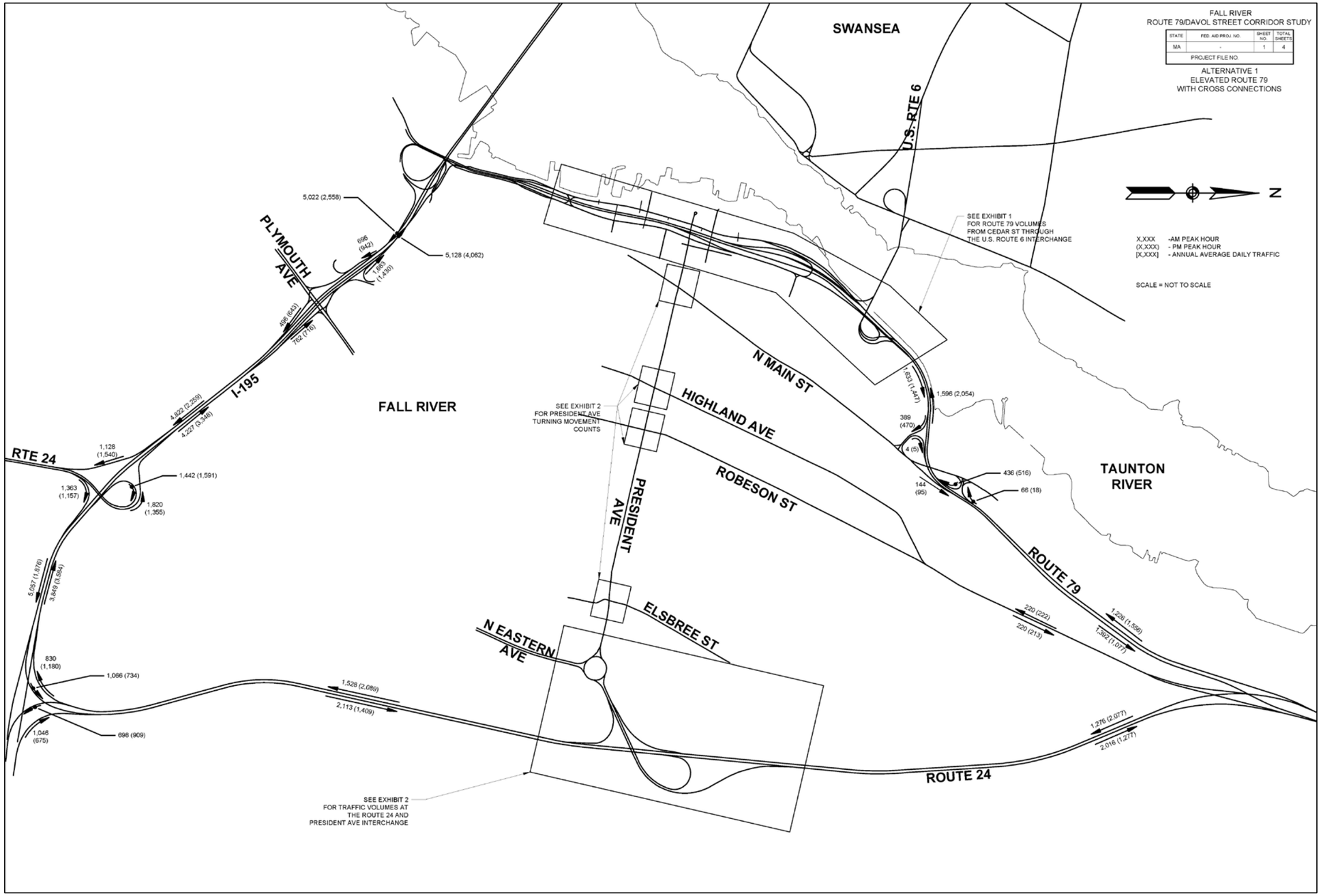


Figure 4.5: Alternative 1 – Traffic Volumes Map

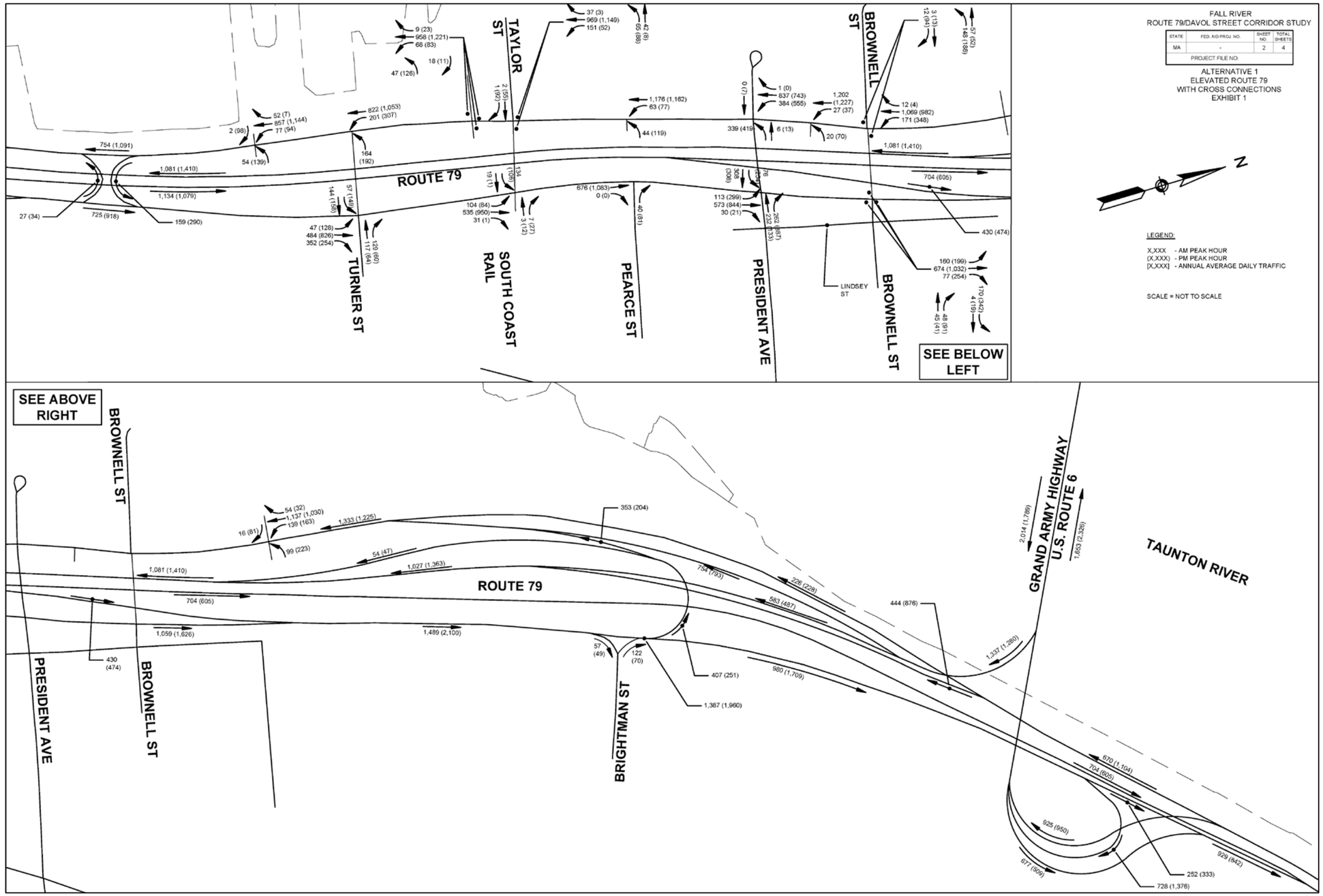


Figure 4.6: Alternative 1 – Traffic Volumes Map Exhibit 1

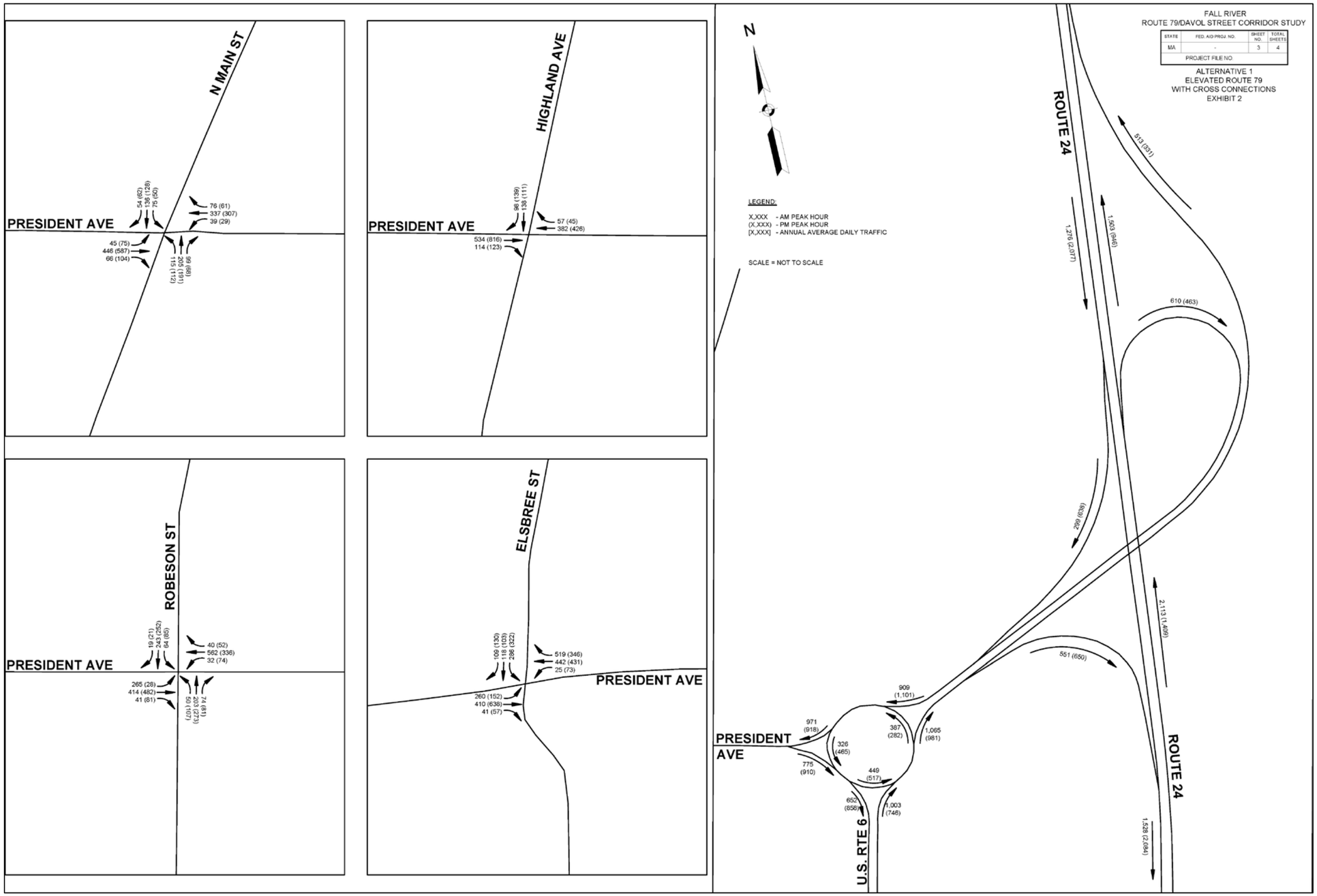


Figure 4.7: Alternative 1 – Traffic Volumes Map Exhibit 2

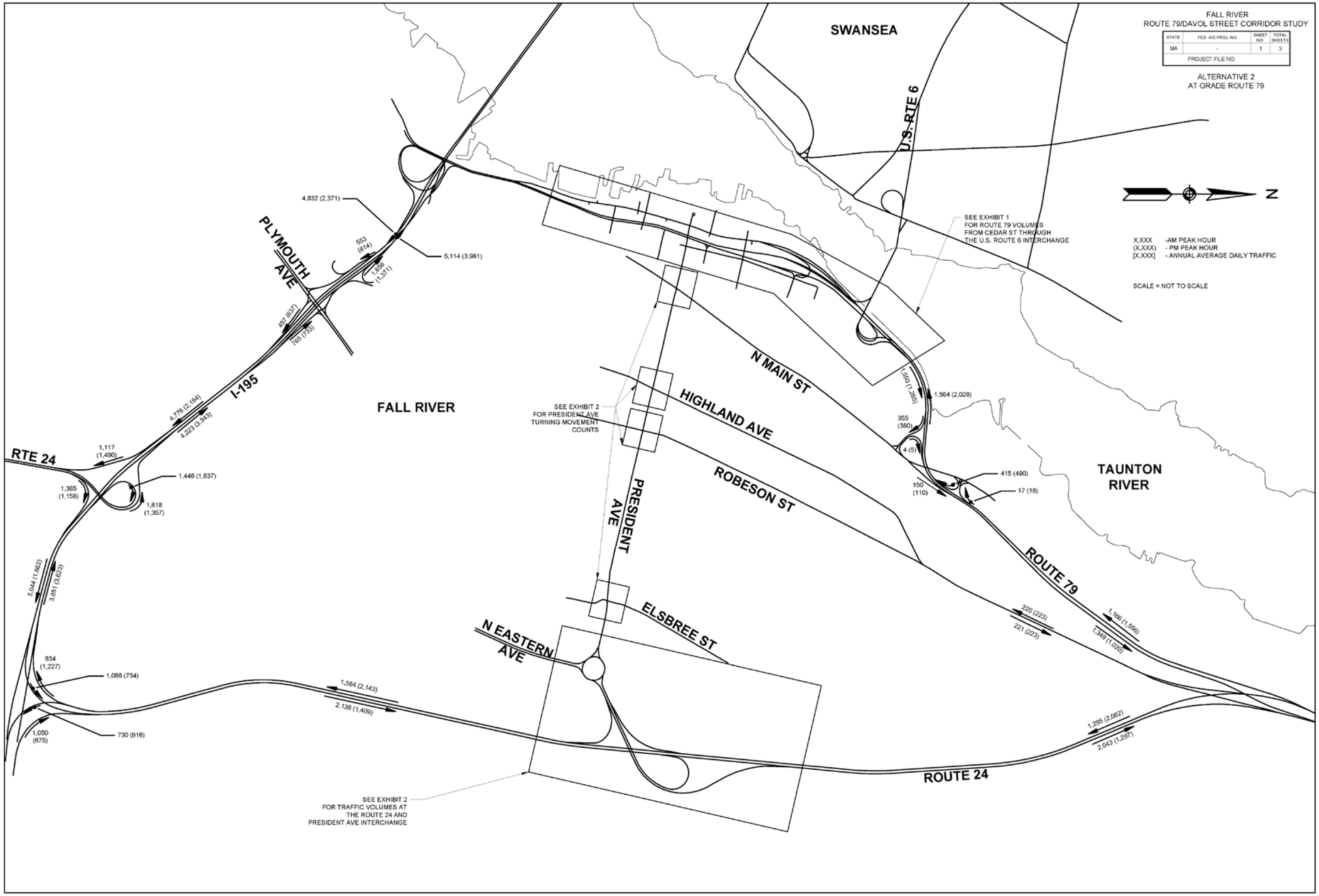


Figure 4.8: Alternative 2 – Traffic Volumes Map

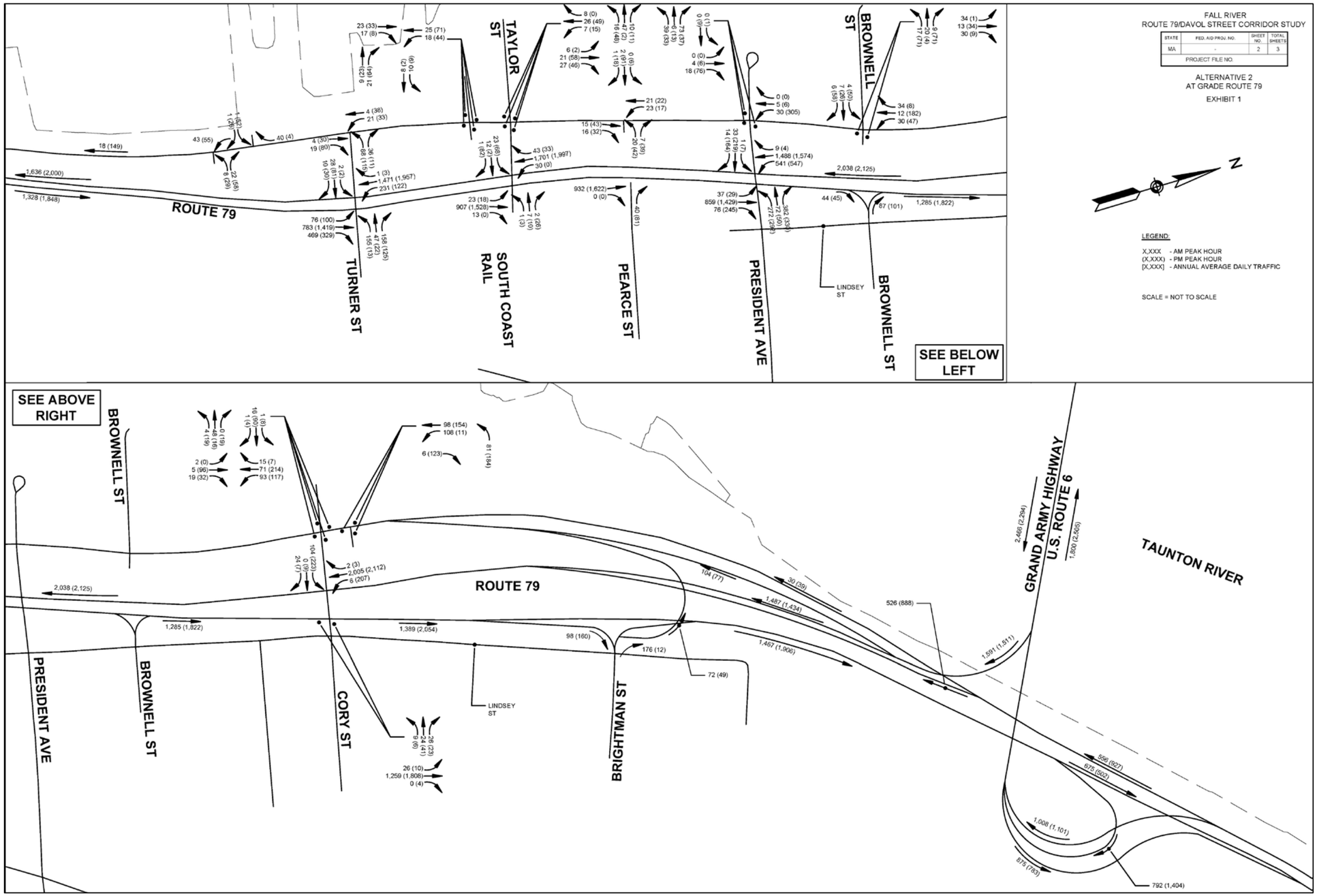


Figure 4.9: Alternative 2 – Traffic Volumes Map Exhibit 1

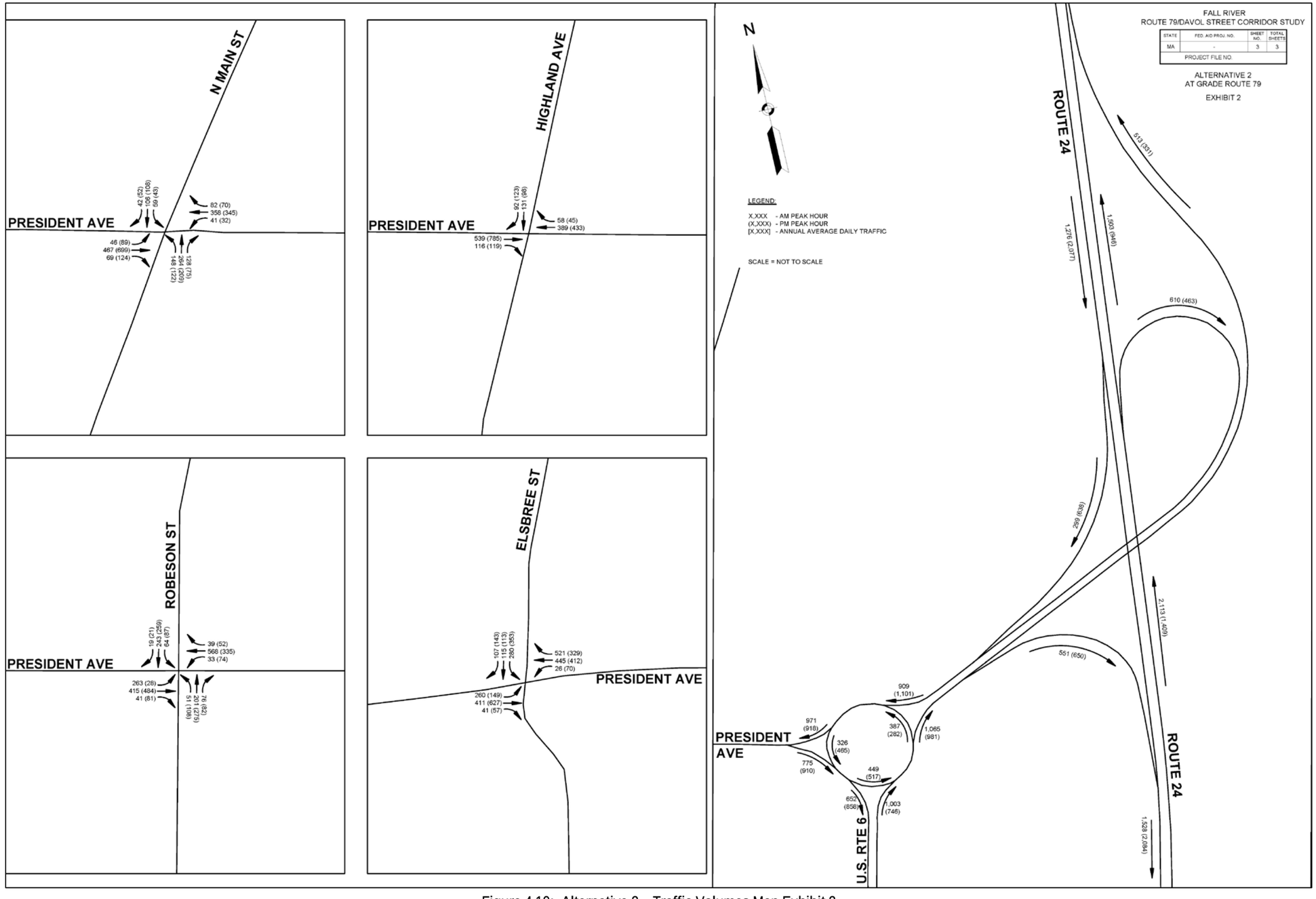


Figure 4.10: Alternative 2 – Traffic Volumes Map Exhibit 2

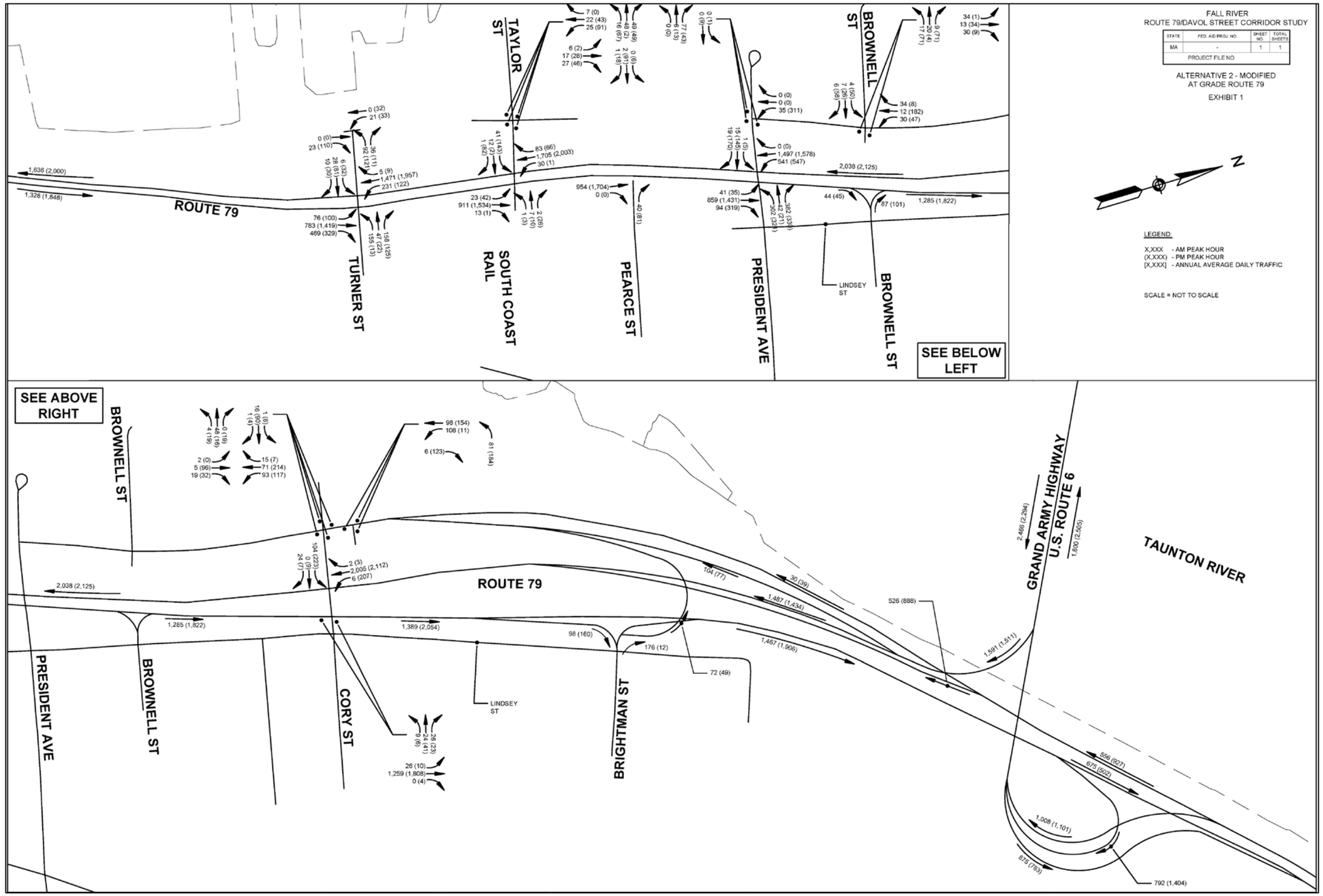


Figure 4.11: Alternative 2 – Modified – Traffic Volumes Map Exhibit 1

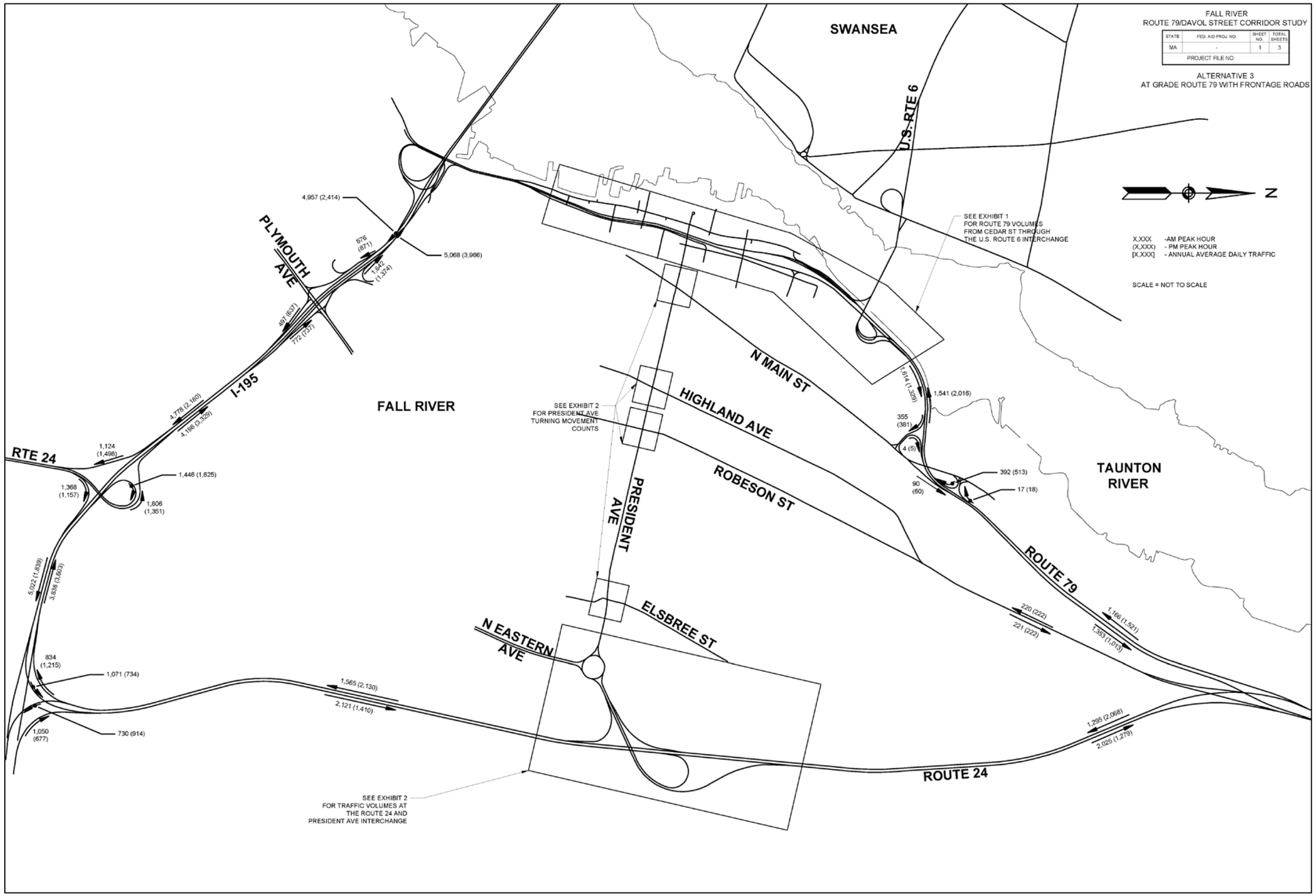


Figure 4.12: Alternative 3 – Traffic Volumes Map

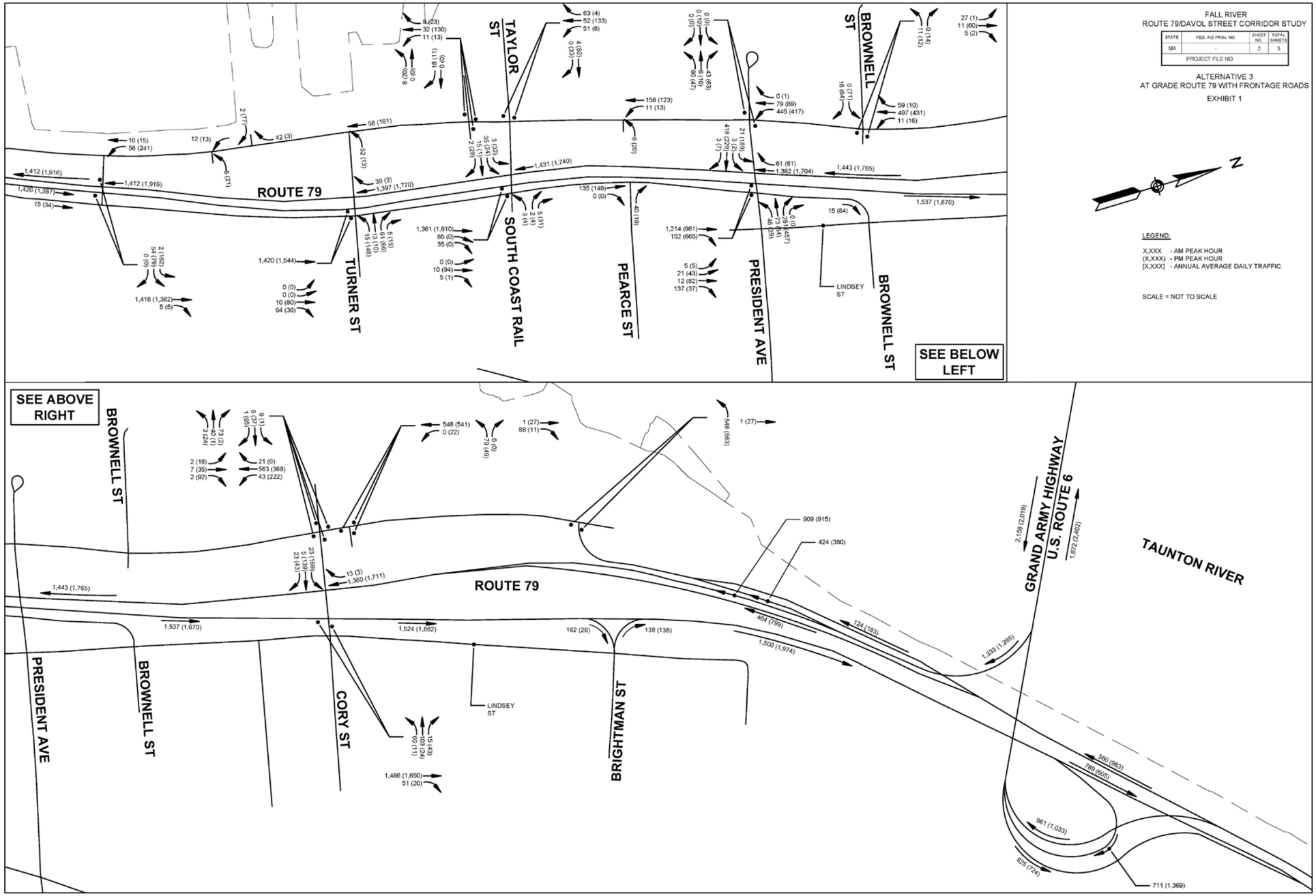


Figure 4.13: Alternative 3 – Traffic Volumes Map Exhibit 1

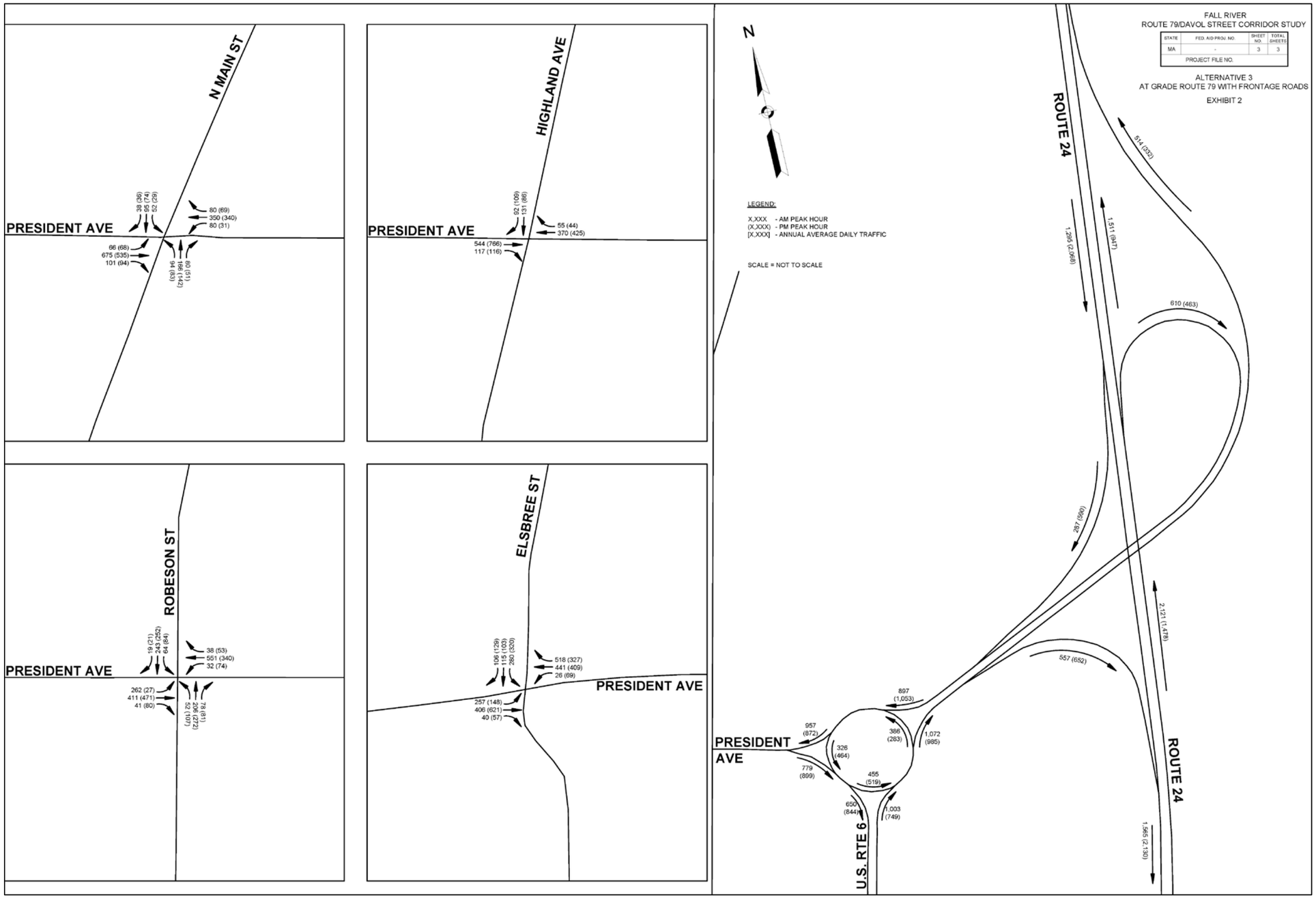


Figure 4.14: Alternative 3 – Traffic Volumes Map Exhibit 2

4.7.4 Traffic Operations Analysis for 2035 Build Alternatives

After compiling the traffic volume information from CTPS for the Focus Area and Regional Transportation Impact Area and determining turning movement numbers at all intersections, traffic operations were analyzed at all intersections and freeway facilities. Just as for the Existing and Future No-Build Scenario analyses, Synchro and the Highway Capacity Manual were used to determine delays, densities and Levels of Service. Operating levels of service are reported on a scale of A to F, with LOS A representing free-flow or uncongested conditions with little or no delay to motorists, and LOS F representing a forced-flow condition with long delays and traffic demands exceeding roadway capacity. For intersections, the operating LOS is a function of vehicle delay. For freeway facilities, the operating LOS is a function of density (passenger cars per mile per lane). The LOS is calculated according to the criteria shown in Table 4.8.

Table 4.8: Level of Service Criteria

Level of Service	Intersections Delay per Vehicle, sec. (v/c ≤ 1.0)		Freeway Facilities Density (pc/mi/ln)
	Unsignalized	Signalized	
A	≤ 10.0	≤ 10.0	≤ 11
B	10.1 to 15.0	10.1 to 20.0	> 11 – 18
C	15.1 to 25.0	20.1 to 35.0	> 18 – 26
D	25.1 to 35.0	35.1 to 55.0	> 26 – 35
E	35.1 to 50.0	55.1 to 80.0	> 35 – 45
F	> 50.0	> 80.0	> 45 or v/c > 1

Source: Highway Capacity Manual, Fifth Edition, Transportation Research Board, National Research Council, Washington, DC, 2010.

Figures 4.15 through 4.19 show the Levels of Service (LOS) for all intersections within the Focus Area for the Future No-Build Condition and all alternatives, including Alternative 2 - Modified. In these figures, circles are provided at all intersections, signifying the LOS in the AM peak hour (left half of each circle) and the LOS in the PM peak hour (right half of each circle). Green is used for LOS A, B and C. Yellow is used for LOS D, while orange and red are used for LOS E and F, respectively.

Under Future No-Build conditions within the Davol Street Corridor, LOS during the AM Peak Hour are at C or better. During the PM Peak Hour, conditions along President Avenue at Davol Street Southbound and at Lindsey Street worsen to LOS D. At Brownell Street and Davol Street West, the LOS worsens to F.

Intersections in Alternatives 1 and 2 operate with a LOS C or better during the AM and PM peak hours with the exception of Brownell Street at Davol Street East in Alternative 1. Its LOS worsens to D in the PM Peak Hour. Alternative 2 – Modified has worse operations than Alternative 2. In the AM Peak Hour, all intersections operate with a LOS of C or better, but in the PM Peak Hour, a number of intersections worsen to LOS D. In both peak hours, there are a number of approaches whose individual LOS is E or F. In Alternative 3, there are three

intersections along Route 79 that see capacity issues during both peak hours. Turner Street and South Coast Rail operate at LOS D while President Avenue operates at LOS E.

Throughout the Regional Transportation Impact Area, Alternatives 1, 2 and 3 generally do not negatively impact traffic operations as compared to the Future No-Build conditions. Along I-195, the interchanges with Plymouth Avenue and Route 24 operate at LOS D during the morning and at LOS C or better during the afternoon. The interchange of Route 24 with U.S. Route 6 has a LOS C or better at all times. The interchanges along Route 79 with U.S. Route 6 and Main Street also maintain a LOS C or better at all times. The interchange at Route 24 and Route 79 in the northbound direction operates at LOS D and at C or better in the AM and PM, respectively. In the southbound direction, the interchange has a LOS C or better in the morning and at E in the afternoon. In Alternative 2, diversions through Somerset cause the LOS along the Veterans Memorial Bridge to worsen to D. In all other alternatives, the LOS is C or better.

Figure 4.15: Level of Service within Focus Area in Future No-Build Conditions

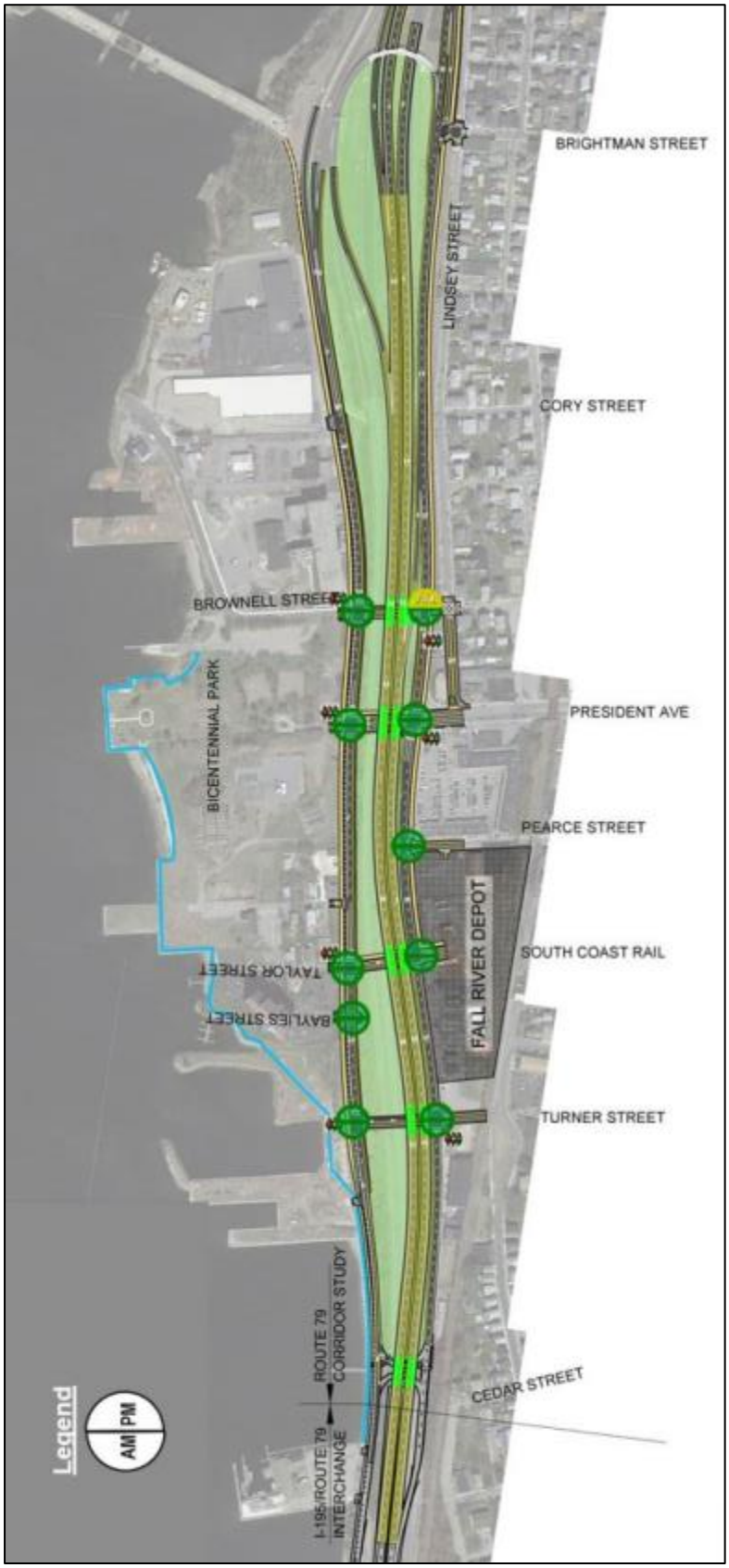


Figure 4.16: Level of Service within Focus Area in Alternative 1

Figure 4.17: Level of Service within Focus Area in Alternative 2

Figure 4.18: Level of Service within Focus Area in Alternative 2 – Modified

Figure 4.19: Level of Service within Focus Area in Alternative 3

4.7.4.1 Alternative 1 – 2035 Traffic Analysis

Alternative 1 requires the addition of several traffic signals along Northbound and Davol Street Wests to accommodate new traffic due to development and new east-west roadways. Currently, traffic signals are only located at the intersections with President Avenue. Under Alternative 1, new signals are located along Davol Street West at Brownell Street, Taylor Street and Turner Street and along Davol Street East at Turner Street and Brownell Street.

With the addition and optimization of these traffic signals, the additional traffic seen within the corridor due to development does not impair traffic operations versus the Future No-Build condition. During the AM Peak Hour, traffic operations are at LOS C or better. In the PM Peak Hour, conditions only worsen at the intersection of Davol Street East at Brownell Street which has a LOS of D. Traffic operations data for freeway segments, weaving segments and ramp segments within the Regional Transportation Impact Area are provided in Tables 4.9 through 4.11. Traffic operations data for all intersections studied are provided in Table 4.12.

Table 4.9: Alternative 1 (2035) along all Freeway Segments

FREEWAY SEGMENTS	AM Peak Hour		PM Peak Hour	
	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Route 24 - Northbound				
North of I-195	B	16.5	A	11.0
North of President Avenue Off-Ramp	B	11.7	A	7.4
North of President Avenue On-Ramp	B	15.7	A	9.9
North of Highland Avenue	B	17.4	B	11.6
North of Route 79	D	31.4	C	20.1
Route 24 - Southbound				
North of Route 79	C	21.5	D	34.7
South of Route 79	B	11.7	B	17.9
South of Highland Avenue	A	9.9	B	16.2
South of President Avenue Off-Ramp	A	7.6	B	11.2
South of President Avenue On-Ramp	B	11.9	B	16.3
I-195 - Eastbound				
West of Plymouth Avenue Off-Ramp	D	27.9	B	13.3
Between Plymouth Avenue Ramps	C	23.0	A	8.4
East of Plymouth Avenue On-Ramp	D	26.4	B	11.7
East of SB Route 24 Off-Ramp	C	19.3	A	3.7
East of NB Route 24 On-Ramp	D	28.2	A	9.7
East of NB Route 24 Off-Ramp	C	20.9	A	5.9
East of SB Route 24 On-Ramp	C	25.4	A	10.6

Table 4.9: Alternative 1 (2035) along all Freeway Segments (Continued)

FREEWAY SEGMENTS	AM Peak Hour		PM Peak Hour	
	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-195 – Westbound				
East of NB Route 24 Off-Ramp	C	21.4	B	16.0
West of NB Route 24 Off-Ramp	B	15.7	B	12.5
West of SB Route 24 On-Ramp	C	20.1	C	18.6
West of SB Route 24 Off-Ramp	B	12.5	A	10.3
West of NB Route 24 On-Ramp	C	22.4	B	17.4
Between Plymouth Avenue Ramps	B	18.0	B	13.7
West of Plymouth Avenue On-Ramp	D	28.7	C	21.4
Route 79 - Northbound				
South of Davol Street East Off-Ramp	A	8.8	A	8.4
North of Davol Street East Off-Ramp	A	5.5	A	4.7
North of North Main Street Off-Ramp	A	9.7	A	7.6
North of SB North Main Street On-Ramp	A	9.7	A	7.6
South of Route 24	A	10.8	A	8.7
Route 79 - Southbound				
South of Route 24	A	9.5	B	12.1
South of North Main Street Off-Ramp	A	9.0	B	12.0
South of North Main Street On-Ramp	B	12.4	B	16.0
South of U.S. Route 6 Off-Ramp	A	5.2	A	8.6
South of Davol Street West Off-Ramp	A	3.5	A	6.8
South of U.S. Route 6 On-Ramp	A	8.0	A	10.6
South of Davol Street West On-Ramp	A	8.4	A	11.0

Table 4.10: Alternative 1 (2035) along all Weaving Segments

WEAVING SEGMENTS	AM Peak Hour			PM Peak Hour		
	LOS	v/c	Density (pc/mi/ln)	LOS	v/c	Density (pc/mi/ln)
NB Route 79 between U.S. Route 6 frontage road and North Main Street Off-Ramp	B	0.42	11.1	A	0.35	9.3

Table 4.11: Alternative 1 (2035) along all Ramp Segments

RAMP LOCATIONS	AM Peak Hour		PM Peak Hour	
	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Route 24 & Route 79				
SB Route 24 Off-Ramp to Route 79	C	27.5	E	38.6
SB Route 24 Off-Ramp to Highland Avenue	B	15.6	C	23.5
NB Route 24 On-Ramp from Highland Avenue	C	23.0	B	16.3
NB Route 24 On-Ramp from Route 79	D	34.2	C	24.9
Route 24 & U.S. Route 6 (President Avenue)				
SB Route 24 Off-Ramp to U.S. Route 6	A	4.4	B	12.3
SB Route 24 On-Ramp from U.S. Route 6	B	13.1	B	18.0
NB Route 24 Off-Ramp to U.S. Route 6	B	15.6	A	8.7
NB Route 24 On-Ramp from U.S. Route 6	B	16.2	A	9.7
Route 24 & I-195 (North of I-195)				
WB I-195 Off-Ramp to Route 24 NB	D	29.2	C	23.2
WB I-195 On-Ramp from Route 24 SB	C	23.7	C	23.3
EB I-195 Off-Ramp to Route 24 NB	D	33.5	B	15.9
EB I-195 On-Ramp from Route 24 SB	C	23.7	A	10.0
Route 24 & I-195 (South of I-195)				
WB I-195 Off-Ramp to Route 24 SB	D	28.4	C	27.5
WB I-195 On-Ramp from Route 24 NB	D	30.7	C	24.7
EB I-195 Off-Ramp to Route 24 SB	D	29.8	B	17.8
EB I-195 On-Ramp from Route 24 NB	D	32.2	B	14.8
I-195 & Plymouth Avenue				
WB I-195 Off-Ramp to Plymouth Avenue	C	27.0	C	22.4
WB I-195 On-Ramp from Plymouth Avenue	D	33.9	C	27.6
EB I-195 Off-Ramp to Plymouth Avenue	D	30.3	B	18.2
EB I-195 On-Ramp from Plymouth Avenue	D	28.9	B	15.8
Route 79 & Main Street				
SB Route 79 Off-Ramp to Main Street	B	11.5	B	14.7
SB Route 79 On-Ramp from Main Street	B	13.2	B	17.2
NB Route 79 On-Ramp from SB Main Street	B	13.1	B	10.9
NB Route 79 On-Ramp from NB Main Street	B	14.9	B	12.2
Route 79 & U.S. Route 6				
SB Route 79 Off-Ramp to U.S. Route 6	B	17.1	C	21.5
SB Route 79 Off-ramp to Davol Street West	A	8.5	B	12.7
SB Route 79 On-Ramp from U.S. Route 6	B	11.6	B	14.6
SB Route 79 On-Ramp from Davol Street East	A	4.1	A	7.0
NB Route 79 Off-Ramp to Davol Street East	A	8.5	A	7.9

Table 4.12: Alternative 1 (2035) at all Intersections

Location	AM Peak Hour					PM Peak Hour				
	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue
Davol Street East at Turner Street	A	7.9	0.48			B	12.9	0.72		
NB Through/Right	A	6.6	0.49	29	80	B	10.9	0.72	137	243
EB Through/Left	B	10.5	0.47	30	95	C	20.9	0.72	97	176
WB Through/Right	A	10.0	0.39	22	83	B	12.7	0.17	16	48
Davol Street East at South Coast Rail	A	5.2				A	3.2			
NB Left/Through/Right	A	2.5	0.19		6	A	1.6	0.06		4
EB Through/Left	C	21.5	0.40		54	C	21.2	0.35		38
WB Through	C	17.8	0.01		1	D	25.0	0.07		5
WB Right	B	10.3	0.01		1	B	10.9	0.05		4
Davol Street East at Pearce Street	A	1.1				A	2.0			
NB Through	A	0.0	0.29		0	A	0.0	0.46		0
WB Right	B	11.5	0.12		10	C	17.1	0.34		37
Davol Street East at President Avenue	B	11.9	0.54			B	17.7	0.78		
NB Left	B	10.4	0.21	15	82	B	16.5	0.57	66	354
NB Through/Right	B	12.5	0.57	46	212	C	22.4	0.83	113	505
EB Left/Through	B	12.3	0.51	35	120	B	17.5	0.97	68	204
WB Through/Right	B	11.4	0.37	19	84	B	11.1	0.28	12	55
Davol Street East at Brownell Street	A	8.5	0.57			D	43.9	0.97		
NB Through/Right	A	5.9	0.54	73	164	D	48.8	1.04	407	507
EB Through/Left	B	19.9	0.65	36	103	C	34.8	0.88	131	278
WB Through/Right	B	13.3	0.15	8	39	B	13.0	0.20	28	61
Davol Street West at Brownell Street	A	9.9	0.66			B	14.3	0.78		
SB Through/Right	A	7.7	0.66	132	226	B	11.5	0.77	197	279
EB Through/Right	B	15.9	0.07	7	23	B	16.6	0.46	57	109
WB Through/Left	C	22.4	0.64	62	129	C	28.7	0.78	82	187
Davol Street West at President Avenue	B	16.7	0.73			C	20.5	0.77		
SB Left/Through/Right	B	14.3	0.76	132	437	B	17.4	0.80	195	524
EB Through/Right	B	16.5	0.00	1	6	B	18.1	0.02	2	15
WB Through	C	24.1	0.65	57	201	C	29.9	0.73	94	280
WB Left	C	25.0	0.66	57	200	C	28.0	0.69	91	266
Davol Street West at Baylies Street	A	0.2				A	0.1			
SB Through/Right	A	0.0	0.50		0	A	0.0	0.63		0
EB Right	B	10.7	0.05		4	B	10.8	0.03		2
Davol Street West at Taylor Street	A	5.5	0.52			A	7.8	0.55		
SB Left/Through/Right	A	3.9	0.52	81	157	A	5.8	0.59	91	191
EB Through/Right	B	18.3	0.01	1	6	B	17.4	0.32	22	79
WB Through/Left	C	21.8	0.52	33	78	B	18.5	0.43	23	76

Table 4.12: Alternative 1 (2035) at all Intersections (Continued)

Location	AM Peak Hour					PM Peak Hour				
	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue
Davol Street West at Turner Street	A	6.5	0.51			A	8.6	0.63		
SB Left/Through	A	4.4	0.49	71	142	A	6.4	0.65	132	236
WB Left	B	19.1	0.55	39	97	C	21.6	0.56	64	117
President Avenue at North Main Street	C	26.2	0.77			C	30.5	0.86		
NB Left/Through/Right	C	25.0	0.72	198	538	D	35.6	0.80	197	464
SB Left/Through Right	B	18.6	0.48	105	278	C	23.5	0.47	103	238
EB Left	B	19.8	0.22	17	59	B	15.9	0.23	29	88
EB Through/Right	C	32.8	0.81	262	574	D	38.4	0.92	410	917
WB Left	C	21.8	0.33	15	59	C	20.1	0.39	12	67
WB Through/Right	C	24.9	0.62	177	387	B	18.0	0.46	147	337
President Avenue at Highland Avenue	C	24.7				F	53.5			
SB Left/Through/Right	F	136.0	1.12		300	F	347.2	1.61		482
EB Left/Through/Right	A	0.0	0.41		0	A	0.0	0.59		0
WB Left/Through/Right	A	0.0	0.31		0	A	0.0	0.33		0
President Avenue at Robeson Street	F	81.3	1.13			C	28.9	0.88		
NB Left/Through/Right	F	104.7	1.03	386	550	C	30.4	0.85	162	430
SB Left/Through/Right	F	130.8	1.10	384	585	B	19.9	0.64	106	302
EB Left/Through/Right	F	108.8	1.15	839	1,087	C	25.4	0.81	184	499
WB Left/Through/Right	B	16.9	0.61	428	520	D	37.8	0.90	166	450
President Avenue at Elsbree Street	C	24.8	0.71			C	21.6	0.67		
SB Left	C	33.8	0.81	104	284	C	34.4	0.85	117	330
SB Through/Right	C	21.3	0.51	59	151	B	18.8	0.47	53	147
EB Left	D	51.8	0.90	97	291	C	26.5	0.60	52	156
EB Through/Right	B	11.0	0.32	39	143	B	16.0	0.61	108	235
WB Left	F	139.3	0.87	8	34	D	42.1	0.68	24	75
WB Through	B	19.2	0.48	67	151	B	18.6	0.49	64	144
WB Right	B	18.5	0.34	0	84	B	17.1	0.23	0	63
President Avenue Rotary	F	80.2				F	329.6			
NB Left	B	13.6	0.56		93	B	11.0	0.43		58
NB Right	E	36.4	0.87		380	C	19.1	0.69		158
EB Through/Right	F	243.4	1.11		1,535	F	961.9	1.52		4,438
WB Left	A	5.0	0.00		0	A	4.5	0.00		0
WB Through	B	11.9	0.47		65	B	10.6	0.46		63

4.7.4.2 Alternative 2 – 2035 Traffic Analysis

Alternative 2 requires four traffic signals along Route 79 at Turner Street, the South Coast Rail station driveway, President Avenue, and Cory Street. With the addition and optimization of these traffic signals, traffic operations are at LOS C or better at all times within the Focus Area. No traffic signals are required along Davol Street West to accommodate traffic due to development. The majority of traffic is located along Route 79, with only traffic related to developments along Davol Street West.

With three lanes in each direction and the presence of exclusive turning lanes, Route 79 is able to accommodate the addition of local traffic to the regional traffic already using Route 79. Traffic operations data for freeway segments, weaving segments and ramp segments within the Regional Transportation Impact Area are provided in Tables 4.13 through 4.15. Traffic operations data for all intersections studied are provided in Table 4.16.

Table 4.13: Alternative 2 (2035) along all Freeway Segments

FREEWAY SEGMENTS	AM Peak Hour		PM Peak Hour	
	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Route 24 - Northbound				
North of I-195	B	16.7	A	11.0
North of President Avenue Off-Ramp	B	11.9	A	7.4
North of President Avenue On-Ramp	B	15.9	A	10.1
North of Highland Avenue	B	17.6	B	11.8
North of Route 79	D	31.2	C	19.9
Route 24 - Southbound				
North of Route 79	C	21.1	D	34.8
South of Route 79	B	11.8	B	18.0
South of Highland Avenue	A	10.1	B	16.2
South of President Avenue Off-Ramp	A	7.8	B	11.6
South of President Avenue On-Ramp	B	12.2	B	16.7
I-195 - Eastbound				
West of Plymouth Avenue Off-Ramp	D	26.4	B	12.3
Between Plymouth Avenue Ramps	C	22.7	A	8.1
East of Plymouth Avenue On-Ramp	D	26.0	B	11.4
East of SB Route 24 Off-Ramp	C	19.1	A	3.7
East of NB Route 24 On-Ramp	D	28.0	A	9.7
East of NB Route 24 Off-Ramp	C	20.7	A	5.9
East of SB Route 24 On-Ramp	C	25.4	A	10.6

Table 4.13: Alternative 2 (2035) along all Freeway Segments (Continued)

FREEWAY SEGMENTS	AM Peak Hour		PM Peak Hour	
	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-195 - Westbound				
East of NB Route 24 Off-Ramp	C	21.4	B	15.9
West of NB Route 24 Off-Ramp	B	15.7	B	12.4
West of SB Route 24 On-Ramp	C	20.1	C	18.9
West of SB Route 24 Off-Ramp	B	12.5	A	10.3
West of NB Route 24 On-Ramp	C	22.3	B	17.4
Between Plymouth Avenue Ramps	B	18.0	B	13.6
West of Plymouth Avenue On-Ramp	D	28.6	C	20.9
Route 79 - Northbound				
South of Davol Street East Off-Ramp	B	11.4	B	14.8
North of Davol Street East Off-Ramp	A	5.3	A	3.9
North of North Main Street Off-Ramp	A	9.3	A	7.0
North of SB North Main Street On-Ramp	A	9.3	A	7.1
South of Route 24	A	10.5	A	7.9
Route 79 - Southbound				
South of Route 24	A	9.1	B	12.1
South of North Main Street Off-Ramp	A	8.9	B	12.0
South of North Main Street On-Ramp	B	12.2	B	15.8
South of U.S. Route 6 Off-Ramp	A	4.3	A	7.2
South of Davol Street West Off-Ramp	A	4.1	A	6.9
South of Davol Street West On-Ramp	B	15.7	C	18.1

Table 4.14: Alternative 2 (2035) along all Weaving Segments

WEAVING SEGMENTS	AM Peak Hour			PM Peak Hour		
	LOS	v/c	Density (pc/mi/ln)	LOS	v/c	Density (pc/mi/ln)
NB Route 79 between U.S. Route 6 frontage road and North Main Street Off-Ramp	B	0.40	10.7	B	0.43	10.8

Table 4.15: Alternative 2 (2035) along all Ramp Segments

RAMP LOCATIONS	AM Peak Hour		PM Peak Hour	
	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Route 24 & Route 79				
SB Route 24 Off-Ramp to Route 79	C	27.1	E	38.6
SB Route 24 Off-Ramp to Highland Avenue	B	15.8	C	23.5
NB Route 24 On-Ramp from Highland Avenue	C	23.2	B	16.6
NB Route 24 On-Ramp from Route 79	D	34.0	C	24.7
Route 24 & U.S. Route 6 (President Avenue)				
SB Route 24 Off-Ramp to U.S. Route 6	A	4.6	B	12.3
SB Route 24 On-Ramp from U.S. Route 6	B	13.4	B	18.5
NB Route 24 Off-Ramp to U.S. Route 6	B	15.8	A	8.7
NB Route 24 On-Ramp from U.S. Route 6	B	16.5	A	9.9
Route 24 & I-195 (North of I-195)				
WB I-195 Off-Ramp to Route 24 NB	D	29.2	C	23.1
WB I-195 On-Ramp from Route 24 SB	C	23.7	C	23.7
EB I-195 Off-Ramp to Route 24 NB	D	33.5	B	15.8
EB I-195 On-Ramp from Route 24 SB	C	23.8	A	9.9
Route 24 & I-195 (South of I-195)				
WB I-195 Off-Ramp to Route 24 SB	D	28.4	C	27.9
WB I-195 On-Ramp from Route 24 NB	D	30.7	C	24.6
EB I-195 Off-Ramp to Route 24 SB	D	29.6	B	17.3
EB I-195 On-Ramp from Route 24 NB	D	32.2	B	14.7
I-195 & Plymouth Avenue				
WB I-195 Off-Ramp to Plymouth Avenue	C	27.0	C	22.4
WB I-195 On-Ramp from Plymouth Avenue	D	33.8	C	27.0
EB I-195 Off-Ramp to Plymouth Avenue	D	29.1	B	16.7
EB I-195 On-Ramp from Plymouth Avenue	D	28.6	B	15.5
Route 79 & Main Street				
SB Route 79 Off-Ramp to Main Street	B	10.9	B	14.7
SB Route 79 On-Ramp from Main Street	B	12.9	B	17.0
NB Route 79 On-Ramp from SB Main Street	B	13.0	B	10.4
NB Route 79 On-Ramp from NB Main Street	B	14.6	B	11.7
Route 79 & U.S. Route 6				
SB Route 79 Off-Ramp to U.S. Route 6	B	16.7	C	21.3
SB Route 79 Off-ramp to Davol Street West	A	7.4	B	11.0
SB Route 79 On-Ramp from U.S. Route 6	B	19.9	C	22.6
NB Route 79 Off-Ramp to U.S. Route 6	B	11.7	B	16.0

Table 4.16: Alternative 2 (2035) at all Intersections

Location	AM Peak Hour					PM Peak Hour				
	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue
Route 79 at Turner Street	C	31.6	0.83			C	25.9	0.65		
NB Left	C	25.7	0.22	32	68	C	29.5	0.31	47	92
NB Through/Right	C	24.5	0.76	174	228	C	22.2	0.83	282	349
SB Left	D	35.9	0.66	108	198	C	30.7	0.38	58	109
SB Through/Right	D	35.5	0.94	261	362	C	28.4	0.93	354	476
EB Left/Through/Right	B	19.4	0.07	11	33	C	29.3	0.30	44	91
WB Left/Through/Right	D	40.4	0.82	147	298	C	28.1	0.20	16	68
Route 79 at South Coast Rail	B	12.9	0.48			C	23.8	0.70		
NB Left	D	40.2	0.54	7	29	C	33.7	0.49	5	22
NB Through	A	9.7	0.40	56	113	A	8.8	0.61	113	147
NB Right	A	7.8	0.01	0	8	A	0.0	0.00	0	0
SB Left	D	43.9	0.60	10	34	A	0.0	0.00	0	0
SB Through/Right	B	13.6	0.77	138	257	D	35.9	1.01	178	430
EB Left/Through/Right	B	15.7	0.08	8	30	B	14.2	0.22	13	60
WB Left/Through/Right	B	15.0	0.01	1	6	B	12.3	0.02	1	11
Route 79 at Pearce Street	A	0.1				A	0.2			
NB Through	A	0.0	0.24	N/A	0	A	0.0	0.41	N/A	0
WB Right	A	8.9	0.38	N/A	3	A	9.8	0.10	N/A	9
Route 79 at President Avenue	C	25.9	0.62			C	34.2	0.81		
NB Left	D	51.0	0.63	15	41	D	43.2	0.45	15	40
NB Through	C	23.2	0.38	125	167	C	34.8	0.92	278	384
NB Right	B	18.2	0.05	0	30	C	20.1	0.23	18	74
SB Left	D	53.5	0.96	119	209	E	76.8	1.02	154	259
SB Through/Right	B	18.8	0.77	164	327	B	19.1	0.73	204	370
EB Left/Through/Right	C	30.4	0.15	7	22	D	47.9	0.73	63	132
WB Left	C	22.6	0.36	50	80	C	31.9	0.48	72	110
WB Through	C	21.2	0.18	24	55	C	28.4	0.15	22	53
WB Right	C	22.5	0.26	0	62	C	29.7	0.23	0	68
Route 79 at Cory Street	B	14.6	0.68			C	22.5	0.85		
NB Left	D	52.0	0.62	8	31	D	36.7	0.30	4	17
NB Through/Right	A	9.9	0.53	85	162	C	29.2	0.95	320	410
SB Left	D	37.8	0.33	2	13	C	34.9	0.73	82	162
SB Through/Right	B	16.6	0.87	175	373	B	13.5	0.81	192	442
EB Left/Through/Right	B	19.4	0.34	28	78	D	39.1	0.77	94	202
WB Left/Through/Right	B	16.1	0.09	8	34	C	20.7	0.14	16	46
Davol Street West at Cory Street	A	5.7				A	6.0			
NB Left/Through/Right	A	0.6	0.00	N/A	0	A	0.0	0.00	N/A	0
SB Left/Through/Right	A	5.5	0.06	N/A	5	A	4.4	0.09	N/A	7
EB Left/Through/Right	B	11.5	0.03	N/A	3	C	19.0	0.30	N/A	31
WB Left/Through/Right	B	12.1	0.10	N/A	8	B	14.7	0.14	N/A	12

Table 4.16: Alternative 2 (2035) at all Intersections (Continued)

Location	AM Peak Hour					PM Peak Hour				
	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue
Davol Street West at President Avenue	A	7.3				A	8.0			
NB Left/Through/Right	A	0.0	0.00	N/A	0	A	0.0	0.00	N/A	0
SB Left/Through/Right	A	6.3	0.02	N/A	2	A	7.9	0.22	N/A	21
EB Through/Right	A	0.0	0.00	N/A	0	C	19.4	0.04	N/A	3
WB Through	A	8.8	0.08	N/A	7	C	20.0	0.13	N/A	11
WB Left	A	9.3	0.05	N/A	4	B	11.6	0.09	N/A	7
Davol Street West at Taylor Street	A	4.8				A	6.0			
NB Left/Through/Right	A	0.8	0.00	N/A	0	A	0.1	0.00	N/A	0
SB Left/Through/Right	A	1.3	0.00	N/A	0	A	1.8	0.01	N/A	1
EB Left/Through/Right	A	9.3	0.00	N/A	0	B	11.0	0.17	N/A	16
WB Left/Through/Right	A	9.7	0.05	N/A	4	B	11.4	0.09	N/A	7
Davol Street West at Turner Street	A	7.6				A	5.1			
NB Through/Right	A	0.0	0.01	N/A	0	A	0.0	0.07	N/A	0
SB Left/Through	A	6.1	0.01	N/A	1	A	3.6	0.02	N/A	2
WB Left/Right	A	9.3	0.14	N/A	12	B	10.5	0.17	N/A	15
President Avenue at North Main St.	C	33.8	0.88			D	52.4	0.99		
NB Left/Through/Right	D	36.0	0.87	299	703	E	74.0	0.96	343	686
SB Left/Through/Right	B	17.5	0.36	77	191	C	34.7	0.44	127	255
EB Left	C	23.2	0.28	21	69	B	19.8	0.28	42	108
EB Through/Right	D	42.1	0.88	325	705	E	64.2	1.00	669	1,248
WB Left	C	30.1	0.52	20	94	D	41.2	0.61	17	97
WB Through/Right	C	29.8	0.68	222	489	C	22.3	0.48	202	404
President Avenue at Highland Ave.	C	21.9				E	36.0			
SB Left/Through/Right	F	128.4	1.09	N/A	279	F	255.6	1.39	N/A	381
EB Left/Through/Right	A	0.0	0.41	N/A	0	A	0.0	0.57	N/A	0
WB Left/Through/Right	A	0.0	0.32	N/A	0	A	0.0	0.34	N/A	0
President Avenue at Robeson Street	F	81.6	1.13			C	34.9	0.89		
NB Left/Through/Right	F	107.1	1.04	389	554	D	43.8	0.90	335	513
SB Left/Through/Right	F	130.8	1.10	384	584	C	27.6	0.69	223	344
EB Left/Through/Right	F	108.9	1.15	838	1,086	C	28.3	0.77	354	540
WB Left/Through/Right	B	17.0	0.62	434	527	D	39.0	0.88	323	499
President Avenue at Elsbree Street	C	22.5	0.69			C	22.3	0.67		
SB Left	C	32.3	0.79	110	280	C	27.2	0.79	134	336
SB Through/Right	C	21.9	0.50	63	155	B	17.8	0.45	62	158
EB Left	C	34.2	0.78	102	282	C	29.5	0.62	59	166
EB Through/Right	B	12.1	0.33	44	147	B	18.8	0.65	128	286
WB Left	D	35.7	0.42	9	37	D	51.0	0.72	26	77
WB Through	C	21.5	0.52	78	164	C	21.3	0.51	71	152
WB Right	C	20.4	0.35	0	88	B	19.5	0.22	0	66

Table 4.16: Alternative 2 (2035) at all Intersections (Continued)

Location	AM Peak Hour					PM Peak Hour				
	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue
President Avenue Rotary	F	85.3				F	324.3			
NB Left	B	13.8	0.59	N/A	95	B	11.1	0.43	N/A	58
NB Right	E	37.8	0.87	N/A	393	C	21.0	0.72	N/A	180
EB Through/Right	F	259.0	1.12	N/A	1,613	F	950.5	1.51	N/A	4,415
WB Left	A	5.0	0.00	N/A	0	A	4.5	0.00	N/A	0
WB Through	B	11.7	0.46	N/A	65	B	10.0	0.43	N/A	55

4.7.4.3 Alternative 2 – Modified – 2035 Traffic Analysis

Alternative 2 – Modified provides traffic signals in the same locations as Alternative 2. They are along Route 79 at the intersections with Turner Street, South Coast Rail, President Avenue, and Cory Street. No traffic signals are required along Davol Street West to accommodate traffic due to development. The majority of traffic is located along Route 79, with only traffic related to developments along Davol Street West.

During the AM Peak Hour, all intersections within the Focus Area have a LOS of C or better, but in the PM Peak Hour, some intersection operations along Route 79 worsen to LOS D. In both peak hours, many approaches at these intersections operate poorly, with LOS E or F. With only two through lanes in each direction along Route 79, the signalized intersections develop long queues of traffic that impact other intersections, particularly in the PM Peak Hour. Along Southbound Route 79, the average and 95th percentile queues extend almost to but not through any neighboring intersections, but the queue from the Cory Street intersection extends to the merge with the on-ramp from U.S. Route 6. While these results do show degradation in operations at the intersections within the Focus Area, these levels of service and delays are during peak traffic hours and are not expected to last for long periods of time. Traffic operations data for all intersections along Route 79 and Davol Street West are provided in Table 4.17.

Table 4.17: Alternative 2 – Modified (2035) at all Intersections

Location	AM Peak Hour					PM Peak Hour				
	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue
Route 79 at Turner Street	C	23.5	0.79			D	46.4	0.88		
NB Left	C	33.9	0.26	65	157	D	41.5	0.39	97	185
NB Through/Right	C	20.2	0.74	285	399	D	36.9	0.98	350	389
SB Left	E	58.2	0.80	144	195	D	39.5	0.47	91	168
SB Through/Right	B	16.7	0.89	252	376	E	56.3	1.08	326	442
EB Left/Through/Right	C	32.0	0.13	41	81	D	47.5	0.57	107	152
WB Left/Through/Right	D	37.0	0.50	86	154	D	36.6	0.13	73	148
Route 79 at South Coast Rail	B	13.9	0.67			B	15.9	0.93		
NB Left	F	100.8	0.81	17	48	E	77.8	0.81	44	111
NB Through	A	7.6	0.43	104	163	A	3.4	0.68	216	311
NB Right	A	7.2	0.01	2	13	A	2.6	0.00	2	31
SB Left	D	36.9	0.46	23	51	D	50.6	0.07	1	10
SB Through/Right	B	14.9	0.82	284	386	B	16.8	0.95	299	498
EB Left/Through/Right	C	33.6	0.22	48	89	E	77.2	0.91	95	107
WB Left/Through/Right	C	30.6	0.02	5	23	C	34.0	0.04	22	58
Route 79 at Pearce Street	A	0.1				B	0.2			
NB Through	A	0.0	0.41	N/A	0	A	0.0	0.73	N/A	0
WB Right	A	9.9	0.06	N/A	4	B	10.5	0.12	N/A	10
Route 79 at President Avenue	C	28.1	0.71			D	50.3	0.95		
NB Left	E	61.6	0.63	35	106	F	124.1	0.90	45	135
NB Through	C	27.9	0.68	218	309	E	56.7	1.00	325	334
NB Right	C	22.6	0.07	84	209	D	37.0	0.34	119	227
SB Left	D	51.6	0.84	173	179	E	72.3	1.02	173	176
SB Through/Right	B	15.3	0.84	344	409	B	18.8	0.83	407	454
EB Left/Through/Right	D	41.5	0.10	18	46	F	161.7	1.18	92	111
WB Left	D	37.0	0.54	87	128	D	44.8	0.64	106	161
WB Through	C	32.1	0.14	23	58	D	36.2	0.08	16	45
WB Right	C	34.2	0.26	52	128	D	40.1	0.30	90	190
Route 79 at Cory Street	C	21.5	0.84			D	35.9	0.97		
NB Left	F	132.8	0.90	27	85	F	115.4	0.79	10	49
NB Through/Right	B	19.1	0.57	254	326	C	30.9	0.99	284	317
SB Left	E	62.3	0.44	10	352	F	95.9	0.98	149	204
SB Through/Right	B	19.8	0.92	352	547	C	24.6	0.95	430	530
EB Left/Through/Right	D	41.4	0.53	80	126	F	118.5	1.07	116	134
WB Left/Through/Right	C	32.2	0.14	42	82	D	35.2	0.18	44	88
Davol Street West at Cory Street	A	5.7				A	6.0			
NB Left/Through/Right	A	0.6	0.00	N/A	0	A	0.0	0.00	N/A	0
SB Left/Through/Right	A	5.5	0.06	N/A	5	A	4.4	0.09	N/A	7
EB Left/Through/Right	B	11.5	0.03	N/A	3	C	19.0	0.30	N/A	31
WB Left/Through/Right	B	12.1	0.10	N/A	8	B	14.7	0.14	N/A	12

Table 4.17: Alternative 2 – Modified (2035) at all Intersections (Continued)

Location	AM Peak Hour					PM Peak Hour				
	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue
Davol Street West at President Avenue	A	8.3				A	8.5			
NB Left/Through/Right	A	0.0	0.00	N/A	0	A	0.0	0.00	N/A	0
SB Left/Through/Right	A	7.3	0.02	N/A	2	A	7.8	0.21	N/A	20
EB Through/Right	A	0.0	0.00	N/A	0	C	17.8	0.04	N/A	3
WB Through/Right	A	8.7	0.08	N/A	7	C	17.4	0.02	N/A	2
WB Left	A	9.5	0.00	N/A	4	A	9.8	0.07	N/A	5
Davol Street West at Taylor Street	A	6.1				A	8.1			
NB Left/Through/Right	A	0.9	0.00	N/A	0	A	0.2	0.00	N/A	0
SB Left/Through/Right	A	3.5	0.00	N/A	1	A	5.3	0.07	N/A	5
EB Left/Through/Right	A	9.4	0.00	N/A	0	B	12.7	0.21	N/A	20
WB Through/Right	A	9.3	0.09	N/A	7	A	8.8	0.05	N/A	4
WB Left	A	9.9	0.06	N/A	4	B	14.1	0.16	N/A	14
Davol Street West at Turner Street	A	7.8				A	5.3			
NB Through/Right	A	0.0	0.01	N/A	0	A	0.0	0.07	N/A	0
SB Left/Through	A	7.3	0.01	N/A	1	A	3.9	0.02	N/A	2
WB Left/Right	A	9.3	0.14	N/A	13	B	10.3	.018	N/A	16

4.7.4.4 Alternative 3 – 2035 Traffic Analysis

The traffic signals along Route 79 in Alternative 3 are set up so that the frontage road (Davol Street East) is part of the same traffic signal as Route 79. These signals, located at Cedar Street, Turner Street, South Coast Rail and President Avenue allow Route 79 traffic movement in the first phase followed by the frontage road in the second phase and the east-west roadway in the third phase. This signal phasing, combined with only providing two lanes in each direction on Route 79, limits capacity at these intersections. Traffic signals are required at the intersection of Route 79 and Cory Street and along Davol Street West at Cory Street and President Avenue as this section is two-way.

Within the Focus Area, all Davol Street West intersections maintain a LOS C or better at all times. Along Route 79 and Davol Street East, the intersections at Turner Street and South Coast Rail operate at LOS D during both the AM and PM Peak Hours. The intersection of President Avenue and Route 79 operates at Level of Service E in the AM and PM Peak Hours. While diversions are created due to Alternative 3, the Veterans Memorial Bridge operates Traffic operations data for freeway segments, weaving segments and ramp segments within the Regional Transportation Impact Area are provided in Tables 4.18 through 4.20. Traffic operations data for all intersections studied are provided in Table 4.21.

Table 4.18: Alternative 3 (2035) along all Freeway Segments

FREEWAY SEGMENTS	AM Peak Hour		PM Peak Hour	
	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Route 24 - Northbound				
North of I-195	B	16.5	A	11.0
North of President Avenue Off-Ramp	B	11.8	A	7.4
North of President Avenue On-Ramp	B	15.8	A	10.0
North of Highland Avenue	B	17.6	B	11.7
North of Route 79	D	31.0	C	19.7
Route 24 – Southbound				
North of Route 79	C	21.1	D	34.0
South of Route 79	B	11.8	B	17.8
South of Highland Avenue	A	10.1	B	16.1
South of President Avenue Off-Ramp	A	7.9	B	11.5
South of President Avenue On-Ramp	B	12.2	B	16.6
I-195 - Eastbound				
West of Plymouth Avenue Off-Ramp	D	27.4	B	12.5
Between Plymouth Avenue Ramps	C	22.7	A	8.0
East of Plymouth Avenue On-Ramp	D	26.1	B	11.3
East of SB Route 24 Off-Ramp	C	19.0	A	3.5
East of NB Route 24 On-Ramp	D	27.9	A	9.5
East of NB Route 24 Off-Ramp	C	20.7	A	5.7
East of SB Route 24 On-Ramp	C	25.4	A	10.5
I-195 - Westbound				
East of NB Route 24 Off-Ramp	C	21.3	B	15.9
West of NB Route 24 Off-Ramp	B	15.6	B	12.4
West of SB Route 24 On-Ramp	C	20.1	C	18.8
West of SB Route 24 Off-Ramp	B	12.4	A	10.3
West of NB Route 24 On-Ramp	C	22.2	B	17.3
Between Plymouth Avenue Ramps	B	17.8	B	13.5
West of Plymouth Avenue On-Ramp	D	28.2	C	20.8
Route 79 - Northbound				
South of Davol Street East Off-Ramp	B	12.1	B	15.4
North of Davol Street East Off-Ramp	A	6.1	A	4.7
North of North Main Street Off-Ramp	A	9.8	A	7.4
North of SB North Main Street On-Ramp	A	9.8	A	7.4
South of Route 24	A	10.5	A	7.9

Table 4.18: Alternative 3 (2035) along all Freeway Segments (Continued)

FREEWAY SEGMENTS	AM Peak Hour		PM Peak Hour	
	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Route 79 - Southbound				
South of Route 24	A	9.1	B	11.8
South of North Main Street Off-Ramp	A	8.9	B	11.7
South of North Main Street On-Ramp	B	12.0	B	15.7
South of U.S. Route 6 Off-Ramp	A	4.5	A	7.7
South of Davol Street West Off-Ramp	A	3.6	A	6.2
South of Davol Street West On-Ramp	A	10.7	B	13.3

Table 4.19: Alternative 3 (2035) along all Weaving Segments

WEAVING SEGMENTS	AM Peak Hour			PM Peak Hour		
	LOS	v/c	Density (pc/mi/ln)	LOS	v/c	Density (pc/mi/ln)
NB Route 79 between U.S. Route 6 frontage road and North Main Street Off-Ramp	B	0.39	10.9	A	0.33	8.8

Table 4.20: Alternative 3 (2035) along all Ramp Segments

RAMP LOCATIONS	AM Peak Hour		PM Peak Hour	
	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
Route 24 & Route 79				
SB Route 24 Off-Ramp to Route 79	C	27.1	E	38.2
SB Route 24 Off-Ramp to Highland Avenue	B	15.8	C	23.4
NB Route 24 On-Ramp from Highland Avenue	C	23.1	B	16.4
NB Route 24 On-Ramp from Route 79	D	33.9	C	24.5
Route 24 & U.S. Route 6 (President Avenue)				
SB Route 24 Off-Ramp to U.S. Route 6	A	4.6	B	12.2
SB Route 24 On-Ramp from U.S. Route 6	B	13.4	B	18.4
NB Route 24 Off-Ramp to U.S. Route 6	B	15.7	A	8.7
NB Route 24 On-Ramp from U.S. Route 6	B	16.3	A	9.8
Route 24 & I-195 (North of I-195)				
WB I-195 Off-Ramp to Route 24 NB	D	29.2	C	23.1
WB I-195 On-Ramp from Route 24 SB	C	23.6	C	23.5
EB I-195 Off-Ramp to Route 24 NB	D	33.4	B	15.6
EB I-195 On-Ramp from Route 24 SB	C	23.8	A	9.8
Route 24 & I-195 (South of I-195)				
WB I-195 Off-Ramp to Route 24 SB	D	28.4	C	27.7
WB I-195 On-Ramp from Route 24 NB	D	30.5	C	24.6
EB I-195 Off-Ramp to Route 24 SB	D	29.6	B	17.2
EB I-195 On-Ramp from Route 24 NB	D	32.1	B	14.6

Table 4.20: Alternative 3 (2035) along all Ramp Segments (Continued)

RAMP LOCATIONS	AM Peak Hour		PM Peak Hour	
	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-195 & Plymouth Avenue				
WB I-195 Off-Ramp to Plymouth Avenue	C	26.9	C	22.3
WB I-195 On-Ramp from Plymouth Avenue	D	33.5	C	26.9
EB I-195 Off-Ramp to Plymouth Avenue	D	29.9	B	17.1
EB I-195 On-Ramp from Plymouth Avenue	D	28.7	B	15.4
Route 79 & Main Street				
SB Route 79 Off-Ramp to Main Street	B	10.9	B	14.4
SB Route 79 On-Ramp from Main Street	B	12.7	B	16.8
NB Route 79 On-Ramp from SB Main Street	B	13.6	B	10.8
NB Route 79 On-Ramp from NB Main Street	B	14.6	B	11.6
Route 79 & U.S. Route 6				
SB Route 79 Off-Ramp to U.S. Route 6	B	16.5	C	21.2
SB Route 79 Off-ramp to Davol Street West	A	7.6	B	11.5
SB Route 79 On-Ramp from U.S. Route 6	B	14.5	B	17.5
NB Route 79 Off-Ramp to Davol Street East	B	12.1	B	16.7

Table 4.21: Alternative 3 (2035) at all Intersections

Location	AM Peak Hour					PM Peak Hour				
	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue
Route 79 at Turner Street	D	38.0	0.65			D	47.8	0.89		
NB Through/Right	D	37.0	0.97	380	545	C	29.2	0.93	443	622
NB Frontage Left/Through/Right	C	28.8	0.25	34	73	D	38.1	0.45	66	121
SB Through/Right	D	40.1	0.98	387	559	E	63.2	1.07	643	781
WB Left/Through/Right	C	29.4	0.29	42	85	E	58.5	0.84	142	274
Route 79 at South Coast Rail	D	44.3	0.59			D	35.0	0.73		
NB Through/Right	D	50.7	1.02	431	589	C	28.0	0.92	481	670
NB Frontage Left/Through/Right	C	26.1	0.05	7	23	D	39.1	0.38	56	106
SB Through/Right	D	38.6	0.98	385	553	D	41.3	1.00	564	764
EB Left/Through/Right	C	27.4	0.16	24	56	D	36.4	0.26	37	83
WB Left	C	25.7	0.01	1	8	C	33.1	0.02	2	11
WB Right	C	25.7	0.01	1	11	C	33.3	0.04	2	29
Davol Street East at Pearce Street	A	2.1				A	1.0			
NB Through	A	0.0	0.09	N/A	0	A	0.0	0.10	N/A	0
WB Right	A	9.2	0.05	N/A	4	A	9.2	0.02	N/A	2

Table 4.21: Alternative 3 (2035) at all Intersections (Continued)

Location	AM Peak Hour					PM Peak Hour				
	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue
Route 79 at President Avenue	C	31.3	0.88			E	64.0	1.04		
NB Through/Right	C	26.8	0.91	321	476	E	58.3	1.03	780	918
NB Frontage Left/Through	C	29.6	0.12	12	34	E	58.4	0.35	39	81
NB Frontage Right	D	54.5	0.77	74	168	F	127.4	0.98	101	229
SB Through/Right	C	32.0	0.95	350	517	E	65.8	1.05	854	996
EB Left/Through/Right	C	28.6	0.60	104	152	D	37.8	0.56	183	241
WB Through	C	29.0	0.44	51	101	C	32.6	0.07	53	97
WB Right	D	43.1	0.80	134	261	F	95.9	1.05	418	630
Route 79 at Cory Street	B	11.4	0.68			C	20.4	0.89		
NB Through/Right	B	11.7	0.80	208	293	B	17.9	0.91	272	460
SB Through/Right	A	9.7	0.72	169	237	C	20.1	0.93	288	478
EB Left/Through/Right	B	16.2	0.42	8	31	D	35.3	0.83	123	263
WB Left/Through/Right	C	20.3	0.1	55	108	B	16.1	0.15	19	47
Davol Street West at Cory Street	A	7.9	0.5			A	8.3	0.6		
NB Left/Through/Right	A	3.5	0.01	1	5	A	3.5	0.13	4	19
SB Left/Through/Right	A	7.3	0.68	64	165	A	8.7	0.73	65	176
EB Left/Through/Right	B	10.6	0.05	2	17	B	12.1	0.16	6	46
WB Left/Through/Right	B	11.1	0.17	7	45	B	11.9	0.10	4	25
Davol Street West at President Avenue	A	6.3	0.34			A	5.9	0.29		
SB Left	A	6.0	0.41	23	64	A	5.7	0.40	20	50
SB Through/Right	A	6.1	0.42	23	65	A	5.7	0.40	20	51
EB Through/Right	A	0.0	0.00	0	0	A	6.6	0.02	1	7
WB Through	A	6.8	0.04	1	15	A	6.8	0.07	1	17
WB Left	A	7.4	0.24	9	37	A	7.0	0.13	4	20
Davol Street West at Taylor Street	A	2.6				A	4.8			
SB Left/Through/Right	A	2.4	0.03	N/A	3	A	0.3	0.00	N/A	0
EB Through/Right	B	10.4	0.01	N/A	0	B	10.5	0.16	N/A	14
Davol Street West at Turner Street	A	4.3				A	0.7			
SB Through	A	0.0	0.04	N/A	0	A	0.0	0.10	N/A	0
WB Left	A	9.1	0.06	N/A	5	A	9.5	0.02	N/A	1
President Avenue at North Main Street	C	29.8	0.86			B	18.1	0.75		
NB Left/Through/Right	D	52.0	0.86	232	513	C	27.7	0.70	102	303
SB Left/Through/Right	C	32.3	0.49	105	226	C	20.4	0.32	41	123
EB Left	B	12.6	0.18	22	69	A	9.9	0.20	14	61
EB Through/Right	C	29.2	0.86	443	982	B	18.3	0.77	191	603
WB Left	B	16.9	0.41	15	73	B	10.1	0.18	6	36
WB Through/Right	B	15.2	0.45	156	358	B	11.8	0.47	92	282

Table 4.21: Alternative 3 (2035) at all Intersections (Continued)

Location	AM Peak Hour					PM Peak Hour				
	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue	Level of Service	Delay	v/c	50th Percentile Queue	95th Percentile Queue
President Avenue at Highland Avenue	C	19.8				C	21.7			
SB Left/Through/Right	F	114.5	1.05	N/A	264	F	168.0	1.17	N/A	285
EB Left/Through/Right	A	0.0	0.42	N/A	0	A	0.0	0.56	N/A	0
WB Left/Through/Right	A	0.0	0.00	N/A	0	A	0.0	0.33	N/A	0
President Avenue at Robeson Street	E	78.5	1.12			C	33.5	0.88		
NB Left/Through/Right	F	100.9	1.02	394	558	D	42.5	0.89	327	500
SB Left/Through/Right	F	115.7	1.06	373	573	C	26.9	0.67	213	327
EB Left/Through/Right	F	107.8	1.14	832	1,079	C	26.8	0.74	342	498
WB Left/Through/Right	B	17.3	0.61	422	515	D	36.8	0.86	325	501
President Avenue at Elsbree Street	C	22.4	0.69			C	21.1	0.64		
SB Left	C	32.2	0.79	110	280	C	26.3	0.76	118	302
SB Through/Right	C	21.9	0.50	63	155	B	18.0	0.43	54	144
EB Left	C	34.0	0.77	100	277	C	28.2	0.60	57	165
EB Through/Right	B	12.0	0.33	43	146	B	17.4	0.62	123	270
WB Left	D	35.6	0.42	9	37	D	47.2	0.70	26	76
WB Through	C	21.4	0.52	77	163	C	20.1	0.48	69	148
WB Right	C	20.3	0.34	0	89	B	18.5	0.22	0	65
President Avenue Rotary	F	83.1				F	316.3			
NB Left	B	3.7	0.56	N/A	93	B	11.1	0.43	N/A	58
NB Right	E	15.7	0.87	N/A	393	C	19.4	0.69	N/A	160
EB Through/Right	F	63.0	1.11	N/A	1,575	F	923.2	1.50	N/A	4,273
WB Left	A	0.0	0.00	N/A	0	A	4.5	0.00	N/A	0
WB Through	B	2.5	0.46	N/A	63	A	9.9	0.42	N/A	55

4.8 Geometric Analysis

Each Route 79 alternative was analyzed to initially determine the extent of impacts that each alternative would have on adjacent and connecting roadways within the Focus Area. A preliminary level of design was completed to lay out each alternative according to AASHTO and MassDOT design criteria, using aerial photography, GIS mapping and construction plans from previously constructed projects. The criteria include, but are not limited to, roadway alignment, lane widths, shoulder widths, curve radii, and sidewalk and shared-use path widths.

4.8.1 Alternative 1

Alternative 1 would maintain the existing character of Route 79 and Davol Streets East and West, but shift Route 79 to be adjacent to Davol Street East. As Route 79 would be an elevated roadway in this alternative, it would not require extensive alignment or profile

modifications to the east-west roadways or to Davol Street East or West as proposed ramps would be similar to existing and any elevation differences between the elevated Route 79 and at-grade roadways would be achieved through the use of retaining walls.

4.8.2 Alternative 2

Alternative 2 would involve lowering Route 79 to the elevations of Davol Street West and Davol Street East. By doing this, Route 79 would be lowered into the 100-year floodplain, but Route 79 would be lowered to elevations that will facilitate intersections with east-west roadways and would not require the construction of retaining walls along Route 79 or the east-west roadways.

Existing terrain and roadway profiles would require steep grades and retaining walls to be used along the ramps between Northbound Route 79 and Brightman Street. Currently, Brightman Street is roughly the same elevation as the Brightman Street U-turn ramp that crosses over Route 79. To maintain vertical clearance underneath this structure, Route 79 must stay at its existing elevation under the ramp, creating an elevation difference between Northbound Route 79 and Brightman Street of over 20 feet. This would force the ramps providing Brightman Street access to follow steep grades of roughly 9% to make up the significant elevation difference between the two roadways. This slope is within the maximum allowable grades for Urban Minor Arterials, such as Brightman Street. The functional classification of Urban Minor Arterial was applied to Brightman Street prior to the construction of Veterans Memorial Bridge, when the roadway had a direct connection to the Brightman Street Bridge. Based on the current use of this road, Brightman Street functions more as a Collector or Local Road. The maximum allowable grades are higher for both of these roadway classifications. This profile requires further refinement based on topographic survey to determine the precise profile required to maintain vertical clearance under the Brightman Street U-turn bridge or whether a design exception is required for this location.

4.8.3 Alternative 2 – Modified

Alternative 2 – Modified would have the same profile as Alternative 2. This alternative would lower Route 79 to the elevations of Davol Street West and Davol Street East. While Route 79 would be lowered into the 100-year floodplain at the southern limits of the Focus Area, the profile of the roadway would facilitate intersections with east-west roadways without requiring retaining wall construction.

Existing terrain and roadway profiles would require steep grades and retaining walls to be used along the ramps between Northbound Route 79 and Brightman Street. Currently, Brightman Street is roughly the same elevation as the Brightman Street U-turn ramp that crosses over Route 79. To maintain vertical clearance underneath this structure, Route 79 must stay at its existing elevation under the ramp, creating an elevation difference between Northbound Route 79 and Brightman Street of over 20 feet. This would force the ramps providing

Brightman Street access to follow steep grades to make up the significant elevation difference between the two roadways.

4.8.4 Alternative 3

Alternative 3 would have the same profile as Alternatives 2 and 2 – Modified south of Cory Street. North of Cory Street, because the Brightman Street U-turn is removed in this alternative, the profile of Route 79 can be raised to match the existing elevation of Brightman Street. The turning lanes to and from Brightman Street along Northbound Route 79 would not require the construction of retaining walls or steep grades as seen in Alternatives 2 and 2 – Modified.

4.9 Multi-Modal Analysis

As the Route 79 alternatives involve the reconfiguration of Route 79 and modification of access to Davol Street West and Davol Street East, the impacts of each alignment on multimodal operations within the Focus Area were analyzed. Each alternative would improve access to South Coast Rail because an east-west connection with a shared-use path and sidewalk provides vehicular, bicycle and pedestrian access to Fall River Depot. Throughout the corridor, sidewalks or shared-use paths are provided along each side of all at-grade roadways in each alternative. This provision makes the waterfront and developments accessible for pedestrians and bicyclists by providing new facilities and creating new east-west connections between existing Fall River neighborhoods and the waterfront. The inclusion of shared-use paths through the corridor also extends the existing bike path that crosses the Veterans Memorial Bridge and ends at Wellington Street.

Each alternative would have different impacts on the Southeastern Regional Transportation Authority (SRTA) Bus Routes 2 and 14. As discussed in Chapter 2, Bus Route 2 operates between the downtown bus terminal and northern Fall River, primarily along North Main Street with a stop at Commonwealth Landing. Bus Route 14 provides service between the downtown bus terminal and the Swansea Mall via the Braga Bridge. According to the Bus Feeder Memo released as part of the Final Environmental Impact Report (FEIR) for South Coast Rail in 2013, SRTA Bus Route 2 would likely be modified to reroute North Main Street to Davol Street East between Odd Street and President Avenue to provide service to Fall River Depot.

Each alternative requires some modifications to Bus Route 2 and suggest an alternate route to the Fall River Depot bus stop. Because inclusion of a bus stop at Fall River Depot already requires modifications to Bus Route 2, it is not anticipated that the diversions discussed below will cause any significant change in bus travel times versus the route described in the Bus Feeder Memo. Further, as developments are constructed within the Focus area, it should be reevaluated whether bus stops should be added within the Focus Area or if existing Bus Routes should be modified.

4.9.1 Alternative 1

Along Bus Route 2, the Commonwealth Landing stop could be maintained in its current position in front of the building and be reached via the Brightman Street U-turn ramp, or the stop could be relocated to be just south of Brownell Street and reached via Brownell Street. After the Commonwealth Landing stop, the bus could continue south and turn left onto Turner Street to continue to Fall River Depot. After serving the station, the bus could exit onto Pearce Street, turn right onto Davol Street East and turn right onto President Avenue to continue on the remainder of Bus Route 2. Another option to serve the corridor area could be to reroute Bus Route 14 from Somerset across the Veterans Memorial Bridge. It would provide 2 stops: Commonwealth Landing at Brownell Street and Davol Street West and Fall River Depot at Davol Street East and Turner Street.

4.9.2 Alternative 2

The existing SRTA Bus Route 2 would require modifications with implementation of Alternative 2. The existing Brightman Street U-turn ramp is only accessible from Brightman Street. For the Commonwealth Landing stop, buses could turn left onto Cory Street and turn left again onto Davol Street West where it could access the Commonwealth Landing stop in its existing location. To provide service to Fall River Depot, buses could continue south along Davol Street West and turn left onto Turner Street to continue to Fall River Depot. After serving this station, the bus could exit onto Pearce Street, turn right onto Davol Street East and turn right onto President Avenue to continue on the remainder of Bus Route 2. Another option to serve the corridor area would be to reroute Bus Route 14 from Somerset across the Veterans Memorial Bridge. It could provide 2 stops: Commonwealth Landing at Cory Street and Davol Street West and Fall River Depot at Davol Street East and Turner Street.

4.9.3 Alternative 2 – Modified

The existing SRTA Bus Route 2 would require modifications with implementation of Alternative 2 – Modified. The existing Brightman Street U-turn ramp is only accessible from Brightman Street. For the Commonwealth Landing stop, buses could turn left onto Cory Street and turn left again onto Davol Street West where it could access the Commonwealth Landing stop in its existing location. To provide service to Fall River Depot, buses could continue south along Davol Street West and turn left onto Turner Street to continue to Fall River Depot. After serving this station, the bus could exit onto Pearce Street, turn right onto Davol Street East and turn right onto President Avenue to continue on the remainder of Bus Route 2. Another option to serve the corridor area could be to reroute Bus Route 14 from Somerset across the Veterans Memorial Bridge. It could provide 2 stops: Commonwealth Landing at Cory Street and Davol Street West and Fall River Depot at Davol Street East and Turner Street.

4.9.4 Alternative 3

The existing SRTA Bus Route 2 would require modifications with implementation of Alternative 3. The existing Brightman Street U-turn ramp is removed in this alternative. For the Commonwealth Landing stop, buses could turn right onto Lindsey Street from President Avenue. From here, buses could turn left onto Cory Street and turn left onto Davol Street West to reach the Commonwealth Landing stop in its existing location. To provide service to Fall River Depot, buses could continue south along Davol Street West and turn left onto Turner Street to continue to Fall River Depot. After serving this station, the bus could exit onto Pearce Street, turn right onto Davol Street East and turn right onto President Avenue to continue on the remainder of Bus Route 2. Another option to serve the corridor area could be to reroute Bus Route 14 from Somerset across the Veterans Memorial Bridge. It could provide 2 stops: Commonwealth Landing at Cory Street and Davol Street West and Fall River Depot at Davol Street East and Turner Street.

4.10 Environmental Analysis

An air quality analysis was completed at the regional level to determine the impacts of each Route 79 alternative on regional emissions. The Transportation Demand Models created by CTPS for the Future No-Build conditions and for the Alternatives 1, 2 and 3 were used to collect estimates of traffic volumes, average highway speeds, vehicle-miles traveled and vehicle-hours traveled. Emission rates developed by the Environmental Protection Agency (EPA) were applied to these data to develop emissions profiles for each alternative. Table 4.22 shows the emissions profiles of the Future No-Build and Route 79 alternatives. The air quality analysis estimated emissions from cars and trucks of carbon monoxide (CO), carbon dioxide (CO_2), nitrogen oxides (NOx) and volatile organic compounds (VOCs). The emissions profiles for all alternatives are very similar. Alternatives 1, 2 and 3 have slightly higher emissions than the Future No-Build due to additional population and employment in the study area and a reduction in average travel speeds within the study area. Alternative 2 – Modified is expected to experience regional emissions levels similar to the other alternatives.

Table 4.22: Regional Air Quality within the Combined AM and PM Peak Periods

Scenario	Regional CO – Winter (kg)	Regional NOx (kg)	Regional VOC (kg)	Regional CO_2 (kg)
Future No-Build	491,200	8,984	10,746	31,911,100
Alternative 1	491,500	8,992	10,756	31,938,300
Alternative 2	491,600	8,990	10,754	31,934,200
Alternative 3	491,500	8,990	10,753	31,932,800

4.11 Environmental Justice Analysis

Environmental Justice serves to ensure that all populations are treated fairly in decisions that will impact their environment. Analysis is completed to verify that groups defined as Environmental Justice

populations are not overly burdened in comparison to those groups not defined as Environmental Justice populations. In order to determine whether any proposed Route 79 alternative disproportionately impacted or burdened any populations, the Transportation Demand Model created by CTPS was used for analysis of environmental, mobility and accessibility impacts. Each build alternative is compared to the Future No-Build condition for both Environmental Justice populations and non-Environmental Justice populations. CTPS uses a paired *t* test with 95% confidence to determine whether the difference experienced by an Environmental Justice population versus a non-Environmental Justice population is statistically significant.

Environmental Justice populations are identified by the demographics of each Transportation Analysis Zone (TAZ). An Environmental Justice population is defined as any TAZ meeting these criteria:

- Low Income Population: Median Household Income at or below $39,399
- Minority Population: 25% or greater minority population
- Limited English Proficiency (LEP): LEP at or greater than 7.61%.

Based on these criteria, of the 44 TAZ in the study area, 32 TAZ are identified as Environmental Justice populations. In Chapter 2, Figure 2.5 presents these three Environmental Justice criteria. Three performance measures are used to evaluate the benefits and burdens on Environmental Justice and Non-Environmental Justice populations. These are accessibility to jobs and needed services, mobility and congestion and environmental impacts.

Accessibility is measured as the ability and the ease of reaching certain destinations within 20 minutes. These destinations include places of employment, health care facilities and higher education facilities.

Mobility and congestion analyses look at auto travel times under congested conditions for trips traveling to and from Environmental Justice zones. Two measures are included within the mobility and congestion metric. These are Highway Production Time, or the average travel time of all automobile trips leaving a TAZ, and Highway Attraction Times, or the average travel time of all automobile trips traveling to a TAZ.

Environmental impacts focus on how the Route 79 alternatives will change the regional and local air quality. The air quality analysis looks at quantities of carbon monoxide (CO), fine particulate matter ($PM_{2.5}$) emitted per square mile, and the average vehicle-miles traveled under congested traffic conditions.

For all three criteria, it is expected that Alternative 2 – Modified will have similar results to those of Alternative 2 because the reduction of the Route 79 cross section in Alternative 2 – Modified is not expected to impact regional and local mobility and access differently than in Alternative 2.

4.11.1 Accessibility Analysis

To measure accessibility, the number of basic, service and retail jobs available within a 20 minute drive is examined. It also takes into account how many hospital beds and college enrollment

slots are available within a 20 minute drive. The job, medical and education information is geocoded into CTPS' base travel demand model for analysis. Results are summarized in Tables 4.23 and 4.24. As can be seen in these tables, there will be very little change in the quantity of accessible jobs due to the Route 79 alternatives. All alternatives show a small decrease in accessible employment and healthcare. Access to education will remain essentially unchanged. These changes are due to a decrease in average travel speed within the study area. It can also be seen that these small reductions in accessibility are similar between the Environmental Justice and Non-Environmental Justice populations and were determined to be statistically insignificant.

Table 4.23: Accessibility Analysis – Employment Opportunities and Services

Scenario	Basic Employment				Retail Employment				Service Employment			
	Available Jobs		Average Travel Time (min)		Available Jobs		Average Travel Time (min)		Available Jobs		Average Travel Time (min)	
	EJ	Non-EJ	EJ	Non-EJ	EJ	Non-EJ	EJ	Non-EJ	EJ	Non-EJ	EJ	Non-EJ
Future No-Build	39,936	37,512	11.9	12.3	25,591	24,273	12.3	13.2	38,115	35,768	11.1	11.4
Alternative 1	39,096	36,596	11.9	12.3	24,723	22,594	12.3	12.9	36,969	35,077	11.0	11.4
Alternative 2	38,998	36,629	11.9	12.3	24,690	22,589	12.4	12.9	36,866	35,057	11.0	11.3
Alternative 3	39,099	36,602	11.9	12.2	24,703	22,613	12.3	12.9	36,936	35,113	11.0	11.3
Comparison of Route 79 Alternatives to Future No-Build Alternative												
Alternative 1	-2.1%	-2.4%	0.0%	0.0%	-3.4%	-6.9%	0.0%	-1.9%	-3.0%	-1.9%	-0.8%	0.0%
Alternative 2	-2.3%	-2.4%	0.0%	0.0%	-3.5%	-6.9%	0.3%	-1.9%	-3.3%	-2.0%	-0.8%	-0.4%
Alternative 3	-2.1%	-2.4%	0.0%	-0.5%	-3.5%	-6.8%	0.0%	-1.9%	-3.1%	-1.8%	-0.8%	-0.4%

Table 4.24: Accessibility Analysis – Higher Education and Healthcare Facilities

Scenario	Education Facilities				Healthcare Facilities			
	Available College Enrollment		Average Travel Time (min)		Available Hospital Beds		Average Travel Time (min)	
	EJ	Non-EJ	EJ	Non-EJ	EJ	Non-EJ	EJ	Non-EJ
Future No-Build	13,948	12,152	12.0	11.1	747	668	9.6	9.8
Alternative 1	13,942	12,152	12.1	11.1	725	668	9.4	9.9
Alternative 2	13,942	12,152	12.1	11.1	725	668	9.3	9.9
Alternative 3	13,943	12,152	12.1	11.1	725	668	9.3	9.8
Comparison of Route 79 Alternatives to Future No-Build Alternative								
Alternative 1	0.0%	0.0%	0.9%	0.0%	-2.9%	0.0%	-2.8%	0.6%
Alternative 2	0.0%	0.0%	0.9%	0.0%	-2.9%	0.0%	-3.0%	0.6%
Alternative 3	0.0%	0.0%	0.9%	0.0%	-2.9%	0.0%	-3.0%	0.4%

4.11.2 Mobility and Congestion Analysis

Table 4.25 provides the results of the mobility and congestion analysis. Alternatives 1, 2 and 3 increase Average Highway Production Time in comparison to the Future No-Build; however there is no change in Average Highway Attraction Time. As in the accessibility analysis, the increase in production time is due to a decrease in overall study area speeds. The changes in times and the changes amongst the Route 79 alternatives between Environmental Justice and Non-Environmental Justice populations are statistically insignificant.

Table 4.25: Mobility and Congestion Analysis

Scenario	Average Highway Production Time (min)		Average Highway Attraction Time (min)	
	EJ	Non-EJ	EJ	Non-EJ
Future No-Build	13.9	15.3	5.8	7.8
Alternative 1	15.0	16.4	5.9	7.9
Alternative 2	15.0	16.4	5.9	7.9
Alternative 3	15.0	16.4	5.9	7.9
Comparison of Route 79 Alternatives to Future No-Build Alternative				
Alternative 1	8.3%	7.0%	1.3%	1.2%
Alternative 2	8.3%	7.0%	1.3%	1.2%
Alternative 3	8.3%	7.0%	1.3%	1.2%

4.11.3 Environmental Analysis

The Environmental Impact Analysis measured changes in air quality due to congested roadway conditions. This analysis was completed for the combined AM and PM 3-hour peak periods. Air quality is worse for all alternatives than in the Future No-Build conditions for both Environmental Justice and Non-Environmental Justice populations. These changes are more pronounced than the air quality results presented in the Environmental Analysis section, as they are localized numbers. The air quality numbers are worsening primarily due to the reduction in average travel speeds. Table 4.26 provides the results of the environmental analysis. The changes between Environmental Justice and Non-Environmental Justice populations are statistically insignificant.

Table 4.26: Environmental Analysis

Scenario	Vehicle-Miles Traveled per Square Mile		CO per Square Mile (g/square mile)		PM2.5 per Square Mile (g/square mile)	
	EJ	Non-EJ	EJ	Non-EJ	EJ	Non-EJ
Future No-Build	40,961	21,443	365,306	189,270	518	271
Alternative 1	42,829	22,251	381,170	196,223	542	281
Alternative 2	41,180	22,111	366,089	195,075	522	279
Alternative 3	40,149	21,568	357,878	190,499	509	272
Comparison of Route 79 Alternatives to Future No-Build Alternative						
Alternative 1	4.6%	3.8%	4.3%	3.7%	4.6%	3.7%
Alternative 2	0.5%	3.1%	0.2%	3.1%	0.7%	3.0%
Alternative 3	-2.0%	0.6%	-2.0%	0.6%	-1.7%	0.6%

4.12 Economic Impact Analysis

The economic impacts of each alternative were evaluated for comparison in two timeframes: the short-term, or construction period impacts, and long-term impacts. Fiscal impacts for the City Fall River were also determined. Alternative 2 – Modified is included in the following discussions but is not included in the economic impact analysis tables as it was developed as a response to comments after the economic impact analysis was completed. The development and associated jobs, residents, tax revenue and other economic impacts were based on the maximum development potential within Fall River for retail, residential and office space.

4.12.1 Construction Period Impacts

The economic impacts of the construction of the three alternatives vary primarily due to the differences in cost and scope of work of the alternatives. It is anticipated that access will be maintained to all businesses within the Focus Area during construction. Alternative 1 requires construction of several bridges in addition to considerable grading and roadway construction. The approximate estimated cost of Alternative 1 is $100 Million. Alternatives 2, 2 – Modified and 3 do not require the same bridge construction, but will require extensive grading and roadway construction. The approximate estimated costs of these alternatives are $55 Million. Due to the increased labor and materials spending of Alternative 1, the total construction period impacts of Alternative 1 are twice that of Alternatives 2, 2 – Modified and 3. See Table 4.27 for the Construction Period Impacts of the alternatives.

Table 4.27: Short-Term Construction Period Impacts of Route 79 Alternatives

Impact	Alternative 1 Elevated Route 79	Alternative 2 At Grade Route 79	Alternative 3 At Grade Route 79 with Frontage Roads
Direct Impacts			
Estimated Construction Cost	$100,000,000	$55,000,000	$55,000,000
Labor Spending (67%)	$66,666,667	$36,666,667	$36,666,667
Construction Wages (50%)	$33,333,333	$18,333,333	$18,333,333
Construction Jobs	527	290	290
State Income/Payroll Tax	$1,402,009	$771,105	$771,105
Indirect/Induced Impacts			
Wages	$29,240,000	$16,082,000	$16,082,000
Jobs	497	274	274
State Income/Payroll Tax	$1,229,842	$676,413	$676,413
Materials Spending			
Estimated Materials Budget (33%)	$33,000,000	$18,150,000	$18,150,000
Percent Tax Exempt	80%		
Taxable Materials	$6,600,000	$3,630,000	$3,630,000
Percent Sourced In-State	75%		
Sales Tax from Materials	$309,375	$170,156	$170,156
Total Economic Impacts			
Wages	$62,573,333	$34,415,333	$34,415,333
Jobs	1,024	563	563
State Income & Sales Taxes	$2,631,851	$1,447,518	$1,447,518

Sources: Bureau of Economic Analysis, RIMSII Multipliers & Cambridge Economic Research

4.12.2 Long-Term Economic Impacts

The proposed development of the alternatives will shift anticipated spending, income, residents and jobs to the Fall River Waterfront. Based on averages recommended by the ITE, it is estimated that there will be one job for every 250 square feet of newly constructed office space. For newly constructed retail space, one job per 400 square feet is assumed. Two residents are assumed for each newly constructed unit. As Alternatives 1, 2 and 2 - Modified can accommodate the most development, these alternatives also bring the most Fall River jobs and residents to the waterfront. Alternative 3, due to transportation system capacity limits, attracts significantly fewer Fall River jobs and residents to the waterfront area. Table 4.28 provides information on Fall River jobs and residents focused along the waterfront due to new development.

Table 4.28: Jobs & Residents Shifted to the Focus Area due to Route 79 Alternatives

Alternative	Land Use			Total Jobs & Residents
	Retail (SF)	Office (SF)	Residential (Units)	
Alternative 1 – Elevated Route 79				
Development	266,500	266,500	724	
Total New Jobs or Residents	666	1,066	1,448	3,180
Alternative 2 – At Grade Route 79				
Development	238,500	238,500	649	
Total New Jobs or Residents	596	954	1,298	2,848
Alternative 3 – At Grade Route 79 with Frontage Roads				
Development	51,000	51,000	137	
Total New Jobs or Residents	128	204	274	606

The jobs and housing generated under the alternatives will generate new household income and state and local taxes. Development within the parcels will attract new residents to Fall River, some living within the new developments. It is assumed that 25% of the residents that live within the new development parcels will also work within the parcels. It is also assumed that 40% of the new jobs will be held by existing Fall River residents.

The economic impact of Alternatives 1 and 2 are the greatest, generating roughly $50 Million in disposable income and producing over $20 Million in state and local taxes. Alternative 3 is projected to produce $14.6 Million in spending by new residents and workers and more than $4 Million in state and local taxes. Alternative 2 – Modified will likely generate disposable income and taxes similar to Alternatives 1 and 2. Table 4.29 provides the economic impacts of the new jobs and residents that could be expected to be produced by each of the Route 79 alternatives.

Table 4.29: Economic Impact of New Jobs & Housing Units in the Route 79 Study Area

Economic Impact	Alternative 1 Elevated Route 79	Alternative 2 At Grade Route 79	Alternative 3 At Grade Route 79 with Frontage Roads
Income from New Households in Development Parcels			
New Housing Units	724	649	137
Number of Occupied Units (95%)	689	618	130
Total Household Income in New Units	$38,458,000	$34,474,000	$7,277,000
Income from New Jobs in Development Parcels			
Total New Jobs	1,732	1,550	332
Number of New Jobs for New Residents (60%)	1,046	930	199
Net New Workers in Fall River (75%)	785	698	149
Total Income Generated by New Workers in Fall River	$38,773,000	$34,476,000	$7,359,000
Total Gross Income from Housing and Jobs in Study Area	$77,231,000	$68,950,000	$14,636,000
Minus State & Local Taxes	$23,169,000	$20,685,000	$4,391,000
Total Disposable Income	$54,062,000	$48,265,000	$10,245,000

Note: Median Household Income of Bristol County is $55,813. There are on average 1.13 wage earners per household, yielding an average wage per worker of $49,392.

Sources: Table E-1, 2000 U.S. Census and Fall River Office of the Assessor

4.12.3 Fiscal Impacts on Fall River

The City of Fall River would also receive tax dollars from the developments under each Route 79 alternative. Table 4.30 presents the projections of property tax revenues resulting from the development supported by the alternatives. Assumptions regarding residential and commercial property values for the new developments were estimated based on conversations with the Fall River Assessor and supplemented by searches of real estate databases. Alternatives 1 and 2 produce the most in property tax revenues, at over $3 Million per year while Alternative 3 provides roughly 20% as much annually. Alternative 2 – Modified will likely provide property tax revenues similar to Alternatives 1 and 2.

Table 4.30: Impact of Alternatives on Local Property Taxes

Alternative	Land Use			Totals
	Retail (SF)	Office (SF)	Residential (Units)	
Average Assessed Value	$110	$100	$240,000	
Tax Rate	0.0254	0.0254	0.0119	
Alternative 1 – Elevated Route 79				
Development	266,500	266,500	724	
Increase in Assessed Value	$29,315,000	$26,650,000	$173,760,000	$229,725,000
New Property Taxes	$745,000	$677,000	$2,068,000	$3,490,000
Alternative 2 – At Grade Route 79				
Development	238,500	238,500	649	
Increase in Assessed Value	$26,235,000	$23,850,000	$155,760,000	$205,845,000
New Property Taxes	$666,000	$606,000	$1,854,000	$3,126,000
Alternative 3 – At Grade Route 79 with Frontage Roads				
Development	51,000	51,000	137	
Increase in Assessed Value	$5,610,000	$5,100,000	$32,880,000	$43,590,000
New Property Taxes	$142,000	$130,000	$391,000	$663,000

Note: The above revenues are also contained in the estimates of state and local taxes in Table 4.26

Sources: Fall River Assessor's Database and internet real estate listings

4.13 Analysis of Additional Community and Working Group Input

During coordination with the Working Group, Federal Highway Administration (FHWA) and at Public Informational Meetings, additional considerations and concerns were presented regarding the analyzed alternatives. The concerns presented by the Working Group and the community at the Public Information Meetings regard the provision of pedestrian bridges. The FHWA presented concerns regarding the existing floodplains and climate change, as well as the elimination of Davol Street West north of President Avenue and the reclamation of right-of-way for land converted to developable parcels.

4.13.1 Provide a Pedestrian Bridge over Route 79

During the Working Group and Public Information Meetings, it was questioned whether it would be feasible or not to provide a pedestrian bridge over Route 79, connecting the existing Fall River neighborhoods to the waterfront. In order to do this, the pedestrian bridge would span Davol Street East, Route 79, and potentially Davol Street West. Providing ADA accessible

walkways would require that switchback ramps be provided if no elevators are present. The ramp would have a total length of roughly 300 feet.

Ideally, a pedestrian bridge would be located where most pedestrians would want to cross the corridor. However, much of the eastern side of Davol Street East is developed with limited space available for construction of a pedestrian bridge structure. If a pedestrian bridge were to be constructed, it would likely be located between Brownell Street and Cory Street. In this area, between Davol Street East and Lindsey Street, there would be room available to construct the ramps required for a bridge.

At this time, it is not known where developments might occur within the Focus Area and where pedestrian desire paths will be located. As developments within the Focus Area are proposed, the necessity and feasibility of a pedestrian bridge should be reviewed and reevaluated. In addition, providing a pedestrian bridge may present a visual barrier to the waterfront and a duplication of existing infrastructure with the at-grade alternatives, as it would construct an elevated structure within the Focus Area.

4.13.2 Convert the Brightman Street U-Turn Ramp to a Pedestrian Bridge

During the Working Group and Public Information Meeting, it was questioned whether it would be feasible to convert the existing Brightman Street U-turn ramp bridge into a pedestrian bridge over Route 79, providing pedestrian and bicyclist access to the Old Brightman Street Bridge and the waterfront.

Maintaining this ramp as a pedestrian and bicycle bridge, with access from Brightman Street, would require that the ramps from Route 79 and U.S. Route 6 maintain their current alignment between the Brightman Street U-turn Bridge and the Old Brightman Street Bridge. In order for pedestrians to access the western side of Davol Street West and the waterfront, there are two options, as seen in Figures 4.20 and 4.21. The first option is constructing a second pedestrian bridge to cross the ramps and access the waterfront near the Old Brightman Street Bridge. The second option requires that pedestrians and bicyclists travel along Davol Street West to Cory Street or Brownell Street where a crosswalk is provided across Davol Street West. The second option would require traveling approximately the same distance as traveling down Lindsey Street to Cory Street or Brownell Street where an east-west connection is provided.

In addition, this alternative would require that the northern project end of Alternative 3 be substituted with the layout of Alternative 2. In Alternative 1, the U-turn ramp originally provides access to the parcel north of Brownell Street. Converting the ramp to a pedestrian bridge requires that Davol Street West north of Brownell Street be a two-way road. In Alternatives 2 and 3, the U-turn ramp provides access from Brightman Street to Davol Street West. Converting the ramp would modify the access to Davol Street West to be from Cory Street.

Figure 4.20: Convert Brightman Street U-turn Bridge to Pedestrian Bridge With Second Bridge to Cross Ramps

Figure 4.21: Convert Brightman Street U-turn Bridge to Pedestrian Bridge With Shared-Use Path to Cory Street

This concept is not carried forward in the alternatives as it would negatively impact the potential for improved Brightman Street access and does not provide an obvious benefit to pedestrians and bicyclists traveling within and through the Focus Area.

4.14 Evaluation Matrix

After completing all analyses, an Evaluation Matrix was assembled in order to assemble and compare the evaluation criteria for the Future No-Build Alternative and the Route 79 Alternatives. The evaluation matrix compares the alternatives based on the following categories:

- Mobility
- Safety
- Health and Environmental Effects
- Land Use and Economic Development
- Community Effects
- Cost

The detailed Evaluation Matrix is included as Table 4.33.

4.14.1 Mobility

Mobility measures the ability of local and regional traffic, as well as pedestrians and bicyclists, to travel through the corridor and access sites and streets within the Focus Area. It also looks at what impacts each of the Route 79 may or may not have on the Regional Transportation Impact Area.

4.14.1.1 Diversions

As discussed previously, outside of diversions, the alternatives have very little impact on the operations of intersections and freeway facilities outside of the corridor. No diversions are anticipated with Alternative 1, but Alternatives 2, 2 – Modified and 3 will create diversions through Somerset. Alternatives 2 and 2 – Modified will create approximately 500 vehicle diversions while Alternative 3 will create approximately 300 vehicle diversions.

4.14.1.2 Traffic Signals and Operation

Traffic signals have different effects on roadways, depending on what the purpose of the roadway is and on the operations of those traffic signals. Traffic signals on Davol Street can help to slow and control traffic, but can also create a stop-and-go effect along the main road. Along Route 79, meant to carry regional through traffic, traffic signals slow traffic and degrade mobility. All alternatives require the installation of new traffic signals. Alternative 1 requires the addition of seven traffic signals on Northbound and Davol Street Wests in order to accommodate crossing and turning movements. Alternatives 2 and 2 - Modified introduce four traffic signals on Route 79 and do not require any traffic signals on Davol Street West. Alternative 3 requires seven traffic

signals, five of them along Route 79. Alternatives 1, 2 and 2 – Modified provide overall improvements over Future No-Build traffic signal operations. In the Future No-Build, one intersection will operate at LOS D while another operates at LOS F. In Alternative 1, only one intersection will operate at a LOS worse than C. In Alternative 2, all intersections will operate at LOS C or better. In Alternative 2 – Modified, three intersections operate at LOS D in the PM Peak Hour. Alternative 3, however, has two intersections that perform at LOS D and another at LOS E, all along Route 79.

4.14.1.3 Vehicular Travel Time

Travel times along Route 79 and Davol Street were determined between Cedar Street and the Veterans Memorial Bridge, a distance of roughly 1 mile. Along Route 79, in both the northbound and southbound directions, this trip takes roughly 1 minute 20 seconds in the Future No-Build conditions and Alternative 1. The introduction of traffic signals along Route 79 in Alternative 2 lengthens this trip by approximately 90 seconds. The intersections in Alternative 3 extend the trip by 2 to 3 minutes.

Along Davol Street, the trip in the northbound direction takes under 3 minutes in the Future No-Build Condition. In Alternative 1, with 2 traffic signals along Davol Street East, this trip worsens by about 1 minute in the PM Peak Hour. In Alternatives 2 and 2 - Modified, the travel time is slightly lower than Future No-Build, at less than 2.5 minutes. Alternative 3 lengthens the northbound trip, by over 1 minute in the morning and by 2 minutes in the afternoon. The alternatives do not have as great an impact on Davol Street West. In Future No-Build Conditions, the travel time is under 2 minutes in the morning and over 2.5 minutes in the afternoon. Alternative 1 requires a travel time 2 minutes in the morning and roughly 2 minutes 20 seconds in the afternoon. Alternatives 2, 2 - Modified and 3 improve the travel times to closer to 1.5 minutes.

4.14.1.4 Pedestrian Travel Time

Pedestrian travel times and delay were calculated to determine how the introduction of intersections along Route 79 in Alternatives 2, 2 – Modified and 3 slow pedestrians but also how the introduction of east-west roadways improve pedestrian travel times and accessibility.

It takes roughly 1 minute 24 seconds for a pedestrian to travel 450 feet along President Avenue between Lindsey Street and Bicentennial Park in the Future No-Build Condition. Alternative 1 sees no change to this travel time. Alternatives 2, 2 – Modified and 3 bring Route 79 to grade and introduce a large intersection for pedestrians to cross. This large intersection between Route 79 and President Avenue adds approximately 20 seconds to the travel time in Alternatives 2 and 2 – Modified and nearly 90 seconds for Alternative 3. The increase in delay between Alternatives 2 and 3 is due to complicated signal phasing of Alternative 3.

To evaluate the impact that the new east-west roadways will have on pedestrian travel, pedestrian time savings were measured along the pedestrian's travel path from Turner Street at Davol Street East to City Pier. In the Future No-Build condition, the path is 3,400 feet long and takes 17.5 minutes to walk. In the 3 Route 79 alternatives, the distance is cut to 560 feet by the addition of the cross street at Turner Street. This new roadway saves pedestrians over 13 minutes in Alternatives 1, 2 and 2 – Modified and nearly 12 minutes in Alternative 3.

4.14.2 Safety

All alternatives provide great improvements in safety for vehicles, pedestrians and bicyclists. Emergency access is improved between Fall River and the waterfront due to the addition of east-west roadways. For bicycles and pedestrians, all alternatives would provide ADA compliant crossings at all intersections and driveways and provide sidewalks and designated bicycle facilities throughout the project limits. For vehicles, all roadways will be designed to the most current AASHTO and MassDOT standards and the high crash locations identified within the Focus Area would be removed or improved. All alternatives remove the southbound Lindsey Street approach to President Avenue, eliminating dangerous turning conflicts. Short-term improvements are made to the intersection of North Main Street at President Avenue, improving conditions for turning vehicles.

4.14.2.1 Pedestrian and Bicycle Safety

In Alternative 1, pedestrians are able to cross underneath Route 79 and do not conflict with regional traffic. In Alternatives 2 and 3, the at-grade Route 79 intersections require that pedestrians and bicyclists cross multiple lanes of traffic, creating long crossings and conflicts at each of these intersections. In Alternative 2 – Modified, the cross section of Route 79 is reduced to two lanes in each direction. Pedestrians will have conflicts at the Route 79 intersections, but crossing times will be shorter than in Alternatives 2 and 3 as the intersections are smaller.

4.14.2.2 Vehicular Safety

Alternative 1 maintains Route 79 as an elevated roadway, isolating regional traffic from local traffic. This reduces the volume of traffic passing through local intersections within the corridor. In Alternative 2 and 2 – Modified, Brownell Street does not intersect with Northbound Route 79 in order to improve sight distance for vehicles and pedestrians at the intersection of Lindsey Street and Brownell Street. In Alternative 3, Davol Street East is realigned at Brownell Street to create a four-leg, stop controlled intersection. All alternatives remove the Cedar Street U-turn, an existing High Crash Location.

4.14.3 Health and Environmental Effects

Health and environmental effects are measured by the Route 79 alternatives' abilities to implement sustainable design, improve water quality and how they impact air quality.

The existing roadway is roughly 57% impervious. No stormwater best management practices or treatment is in place to remove pollutants from stormwater prior to their discharge into the Taunton River which is classified as both impaired and wild and scenic. All alternatives will implement best management practices and treat stormwater prior to discharge. Alternatives 1 and 2 will increase the impervious area within the corridor, but shifting Route 79 will create new area where landscaping and best management practices can be implemented. Alternative 2 - Modified maintains the existing amount of impervious area, but shifts Route 79, creating areas for landscaping and best management practices. Alternative 3 reduces the impervious area within the corridor and provides the greatest amount of open space for stormwater treatment, best management practices and landscaping, as it cannot support the same levels of development as Alternatives 1 and 2.

Emissions are not expected to experience significant changes due to any of the alternatives. The Future No-Build condition has the lowest emissions because the build alternatives shift population and traffic to the developments within the Focus Area. In addition, the build alternatives show traffic through the corridor. Increases in emissions due to implementation of any of the build alternatives are not significant.

4.14.4 Land Use and Economic Development

This metric is measured by the economic development potential of the alternatives and by the socio-economic and fiscal impacts on the community due to the alternatives. The Future No-Build does not create new parcels for development and maintains the "visual barrier" between Fall River and the waterfront. The waterfront can be accessed by one east-west roadway at President Avenue. All alternatives provide new east-west connections, improving access to the waterfront and the development occurring there. Alternatives 1, 2 and 2 – Modified can support the highest levels of new development and Alternative 3 can support some new development. Alternative 3 also creates a 6th parcel for redevelopment, at the Old Brightman Street Bridge.

The socio-economic and fiscal impacts of the Future No-Build conditions are limited to developments that could occur on existing parcels along the west side of the corridor. Development supported by the build alternatives would shift jobs, residents and income to the Fall River waterfront within the Focus Area. Development supported by Alternatives 1, 2 and 2 – Modified could bring to the Focus Area over 1,500 jobs, over 1,300 new housing units, roughly $50 Million in disposable income and over $3 Million annually in property taxes. Alternative 3 can bring the Focus Area over 300 new jobs, 275 new housing units, over $10 Million in disposable income and over $600,000 annually in property taxes. All alternatives provide a net benefit to the City of Fall River.

4.14.5 Community Effects

Impacts to the community are measured among several categories, including pedestrian and bicycle accommodations, local connectivity, visual impacts, construction impacts and Environmental Justice.

4.14.5.1 Pedestrian and Bicycle Accommodations

In the Future No-Build condition, no provisions are provided for bicyclists along existing roadways and the only east-west connection is at President Avenue. While there is nearly 5,000 linear feet of sidewalk within the corridor, the crossings at intersections and driveways are not ADA compliant.

All alternatives extend the existing shared-use path from its current terminus near Wellington Street to beyond South Coast Rail at Turner Street. The shared-use path also crosses Route 79 at three locations in each alternative, improving access between Fall River and the waterfront. An additional shared-use path is provided along the west side of Davol Street West between City Pier and the Old Brightman Street Bridge. Sidewalk is provided along all at-grade roadways within the corridor where shared-use paths are not provided.

4.14.5.2 Local Connectivity

Local connectivity of the Future No-Build and the alternatives is linked to the ability of Fall River to access the waterfront and how access is provided between Brightman Street and Route 79. In the Future No-Build, connectivity to the waterfront is provided only via President Avenue and the Cedar Street Brightman Street U-turns. Brightman Street has been converted to a one-way eastbound roadway and no longer has access to Route 79. Davol Street East is able to turn right onto Brightman Street.

All alternatives improve access between Fall River and the waterfront by providing east-west connecting roads at Turner Street, South Coast Rail, President Avenue and at either Brownell Street or Cory Street. All alternatives return Brightman Street to a two-way roadway. Alternative 1 provides access to and from Davol Street East. Alternatives 2, 2 – Modified and 3 provide direct access for Brightman Street to and from Northbound Route 79.

4.14.5.3 Visual Impacts

The Future No-Build and Alternative 1 both maintain Route 79 as an elevated roadway, seen as a "visual barrier" between Fall River and the waterfront. The Future No-Build

does not provide any open land for new green space, landscaping or redevelopment while all alternatives will create new land for green space, landscaping and redevelopment. Alternative 3 by far creates the most open space, while Alternatives 1, 2 and 2 - Modified can provide for the most redevelopment and businesses along the corridor. Alternatives 2, 2 – Modified and 3 remove the "visual barrier" by bringing Route 79 to grade and also provide medians along Route 79 for additional landscaping.

4.14.5.4 Construction Impacts

All alternatives will require 3 or 4 construction seasons to be built. During construction, access will be maintained to all existing homes and businesses. Alternative 1, while requiring the construction of several bridges, can also be largely constructed off-line from existing roadway alignments, easing construction impacts to traffic and businesses. Alternatives 2, 2 – Modified and 3 will have more complicated construction as the roadway is being brought down to grade, requiring temporary earth supports and significant grading. The construction of all alternatives will bring jobs and income to the Fall River area.

4.14.5.5 Environmental Justice

The Environmental Justice analysis completed for this study looks at how Environmental Justice communities are impacted by the alternatives in comparison to non-Environmental Justice communities. The analysis focused on accessibility to employment, higher education and healthcare, on mobility between transportation analysis zones and on environmental impacts. This study showed that accessibility is slightly reduced, travel times are increased and that emissions will increase. These changes are all due to slower regional speeds, and increased population and jobs within the Focus Area. None of these changes were seen to disproportionately impact one community over another.

4.14.6 Cost

A preliminary construction costs estimate was compiled for each of the alternatives. The costs were based on the preliminary design completed for each alternative and include, but are not limited to, major items such as earthwork, drainage, pavement, maintenance of traffic, structures, erosion control and traffic signals.

Of the alternatives, Alternative 1 is by far the most expensive at an approximate cost of $100 Million. Alternatives 2, 2 – Modified and 3 are estimated to cost roughly $55 Million. All alternatives require extensive earthwork and grading as they all involve shifting the roadway and grading the road to either maintain an elevated highway or lowering the road to the elevation of Davol Street and President Avenue. Alternative 1 is more expensive because of the required

construction of 5 new bridges at each east-west roadway and at the existing Cedar Street U-turn. These approximate construction costs do not include costs for right-of-way reclamation by the Federal Highway Administration (FHWA). When the new parcels are released for redevelopment, the FHWA must be compensated for the land. The right-of-way reclamation costs for Alternatives 1 and 2 are approximately $2.7 Million. Alternatives 2 – Modified and 3 have larger parcels due to a narrower Route 79 cross section and as such, have higher reclamation costs. The cost for Alternative 2 – Modified is roughly $3.5 Million and the cost for Alternative 3 is roughly $4.2 Million. These costs are discussed in greater detail in Section 4.15.2, Valuation of Parcels within the State Highway Layout. In addition, all alternatives will require additional funding for environmental permitting and engineering. Table 4.31 provides a summary of individual and grand total costs for each alternative.

Table 4.31: Estimated Grand Total Costs per Alternative

Cost	Alternative 1	Alternative 2	Alternative 2 – Modified	Alternative 3
Construction Cost	$100 Million	$55 Million	$55 Million	$55 Million
Environmental Permitting and Design	$15 Million	$8 Million	$8 Million	$8 Million
Right-of-Way Reclamation	$2.7 Million	$2.7 Million	$3.5 Million	$4.2 Million
Grand Total Cost	$117.7 Million	$65.7 Million	$66.5 Million	$67.2 Million

4.14.7 Evaluation Matrix

The categories of the Evaluation Matrix (Table 4.33) were compared based on the levels of benefits or impacts that the Future No-Build and the 3 Route 79 alternatives would provide. Table 4.32 provides the legend for the Evaluation Matrix.

Table 4.32: Evaluation Matrix Legend

	Some	Moderate	Substantial
Benefits	○	◒	●
Impacts	□	▬	■
Neutral		◇	

Table 4.33: Evaluation Matrix

Category	Alternatives											
	Future No-Build		1 – Elevated Route 79 with Cross Connections		2 – At Grade Route 79 Boulevard		2 – Modified At Grade Route 79 Boulevard		3 – At Grade Route 79 with Frontage Roads	
	Rating	Discussion	Rating	Discussion	Rating	Discussion	Rating	Discussion	Rating	Discussion
MOBILITY										
Diversions	◇	No Diversions	◇	No Diversions	□	500 Vehicles Diverted	□ [2]	500 Vehicles Diverted	□	300 Vehicles Diverted
Number of Traffic Signals	◇	2 Traffic Signals On Davol Street	□	7 Traffic Signals On Davol Street	▬	4 Traffic Signals On Davol Street	▬	4 Traffic Signals On Davol Street	▬	7 Traffic Signals On Route 79 and Davol Street
Operation	□	• 1 Intersection Operates at LOS D • 1 Intersection Operates at LOS F	◒	• 1 Intersection Operates at LOS D	●	• All Intersections Operate at LOS C or better	●	• 3 Intersections Operate at LOS D	◇	• 2 Intersections Operate at LOS D • 1 Intersection Operates at LOS E
Travel Time Route 79[1] (minutes)	◇	Northbound / Southbound — AM: 1.3 / 1.3 — PM: 1.3 / 1.3	◇	Northbound / Southbound — AM: 1.3 / 1.3 — PM: 1.3 / 1.3	□	Northbound / Southbound — AM: 2.4 / 2.7 — PM: 2.9 / 2.9	□	Northbound / Southbound — AM: 2.5 / 2.4 — PM: 3.0 / 3.3	▬	Northbound / Southbound — AM: 3.4 / 3.3 — PM: 3.5 / 4.5
Travel Time Davol Street[1] (minutes)	◇ ◇	East / West — AM: 2.7 / 1.8 — PM: 2.7 / 2.6	◇ ◇	East / West — AM: 2.8 / 2.0 — PM: 3.7 / 2.3	○ ○	East / West — AM: 2.4 / 1.4 — PM: 2.4 / 1.4	○ ○	East / West — AM: 2.4 / 1.4 — PM: 2.4 / 1.4	□ ○	East / West — AM: 3.9 / 1.6 — PM: 4.7 / 1.7
Pedestrian Delay (along President Ave from Lindsey Street to Bicentennial Park)	◇	Distance: 450 feet PM Peak Hour: 1min 24sec	◇	Distance: 450 feet PM Peak Hour: 1min 24sec	◇	Distance: 450 feet PM Peak Hour: 1min 46sec	◇	Distance: 450 feet PM Peak Hour: 1min 46sec	▬	Distance: 450 feet PM Peak Hour: 2min 55sec
Pedestrian Time Savings (Turner St to City Pier) (Existing travel time is 17min 34sec)	■	Distance: 3,400 feet PM Peak Hour: 0min 0sec	●	Distance: 560 feet PM Peak Hour: 13min 30sec	●	Distance: 560 feet PM Peak Hour: 13min 8sec	●	Distance: 560 feet PM Peak Hour: 13min 8sec	●	Distance: 560 feet PM Peak Hour: 11min 59sec
SAFETY										
Pedestrian and Bicycle Safety	▬	• Existing wheelchair ramps and sidewalks do not meet current design standards and ADA requirements • No designated bicycle facilities are provided within the corridor • Sidewalks provided along one side of NB and SB Davol Streets	●	• ADA compliant crossings at all intersections and driveways. • Designated sidewalks and bike facilities provided throughout project limits. • East-west access provided for bicycles and pedestrians along 4 cross streets without conflict from vehicular traffic	○	• ADA compliant crossings at all intersections and driveways. • Designated sidewalks and bike facilities provided throughout project limits. • Pedestrians and bicyclists have long crossing distances and conflicts at Route 79 intersections.	◒	• ADA compliant crossings at all intersections and driveways. • Designated sidewalks and bike facilities provided throughout project limits. • Pedestrians and bicyclists have conflicts at Route 79 intersections.	○	• ADA compliant crossings at all intersections and driveways. • Designated sidewalks and bike facilities provided throughout project limits. • Pedestrians and bicyclists have long crossing distances and conflicts at Route 79 intersections.

[1] Travel times along Route 79 and Davol Street are measured between the Cedar Street U-turn and the Veterans Memorial Bridge. Travel times are not provided along Davol Street for Alternative 2 – Modified as the roadway length is significantly shorter than the other alternatives.

[2] For analysis purposes, the number of diversions for Alternative 2 – Modified was assumed to be equivalent to those modeled in Alternative 2.

Table 4.33: Evaluation Matrix (Continued)

Category	Alternatives									
	Future No-Build		1 – Elevated Route 79 with Cross Connections		2 – At Grade Route 79 Boulevard		2 – Modified At Grade Route 79 Boulevard		3 – At Grade Route 79 with Frontage Roads	
	Rating	Discussion	Rating	Discussion	Rating	Discussion	Rating	Discussion	Rating	Discussion
SAFETY										
Vehicular Safety	▬	• High crash locations at President Avenue at Lindsey Street, President Avenue at North Main Street, Cedar Street U-turn, and Lindsey Street at Brownell Street • One east-west crossing limits emergency response	●	• Eliminated approach at high crash location of President Avenue and Lindsey Street • North Main Street intersection improved by adding protected left-turn phase (short-term) • Cedar Street U-turn visibility and signage improved (short-term) • Additional crossings provide improved emergency response times	●	• Eliminated approach at high crash location of President Avenue and Lindsey StreetNorth Main Street intersection improved by adding protected left-turn phase (short-term) • Unsafe access to Brownell eliminated • Cedar Street U-turn is eliminated • Additional crossings provide improved emergency response times	●	• Eliminated approach at high crash location of President Avenue and Lindsey StreetNorth Main Street intersection improved by adding protected left-turn phase (short-term) • Unsafe access to Brownell eliminated • Cedar Street U-turn is eliminated • Additional crossings provide improved emergency response times	●	• Eliminated approach at high crash location of President Avenue and Lindsey StreetNorth Main Street intersection improved by adding protected left-turn phase (short-term) • Unsafe access to Brownell eliminated • Cedar Street U-turn is eliminated • Additional crossings provide improved emergency response times
HEALTH AND ENVIRONMENTAL EFFECTS										
Sustainable Design	□	• Existing corridor has 35.0 acres of impervious area (57% impervious) • No treatment or Best Management Practices are in place for existing stormwater prior to discharge into the impaired, wild & scenic Taunton River	○	• Alternative is 72% impervious area, increased over existing impervious area by 9.1 acres. • Shifted roadway allows for more effective area for implementation of best management practices. • Stormwater treated through BMPs prior to discharge will help improve the Taunton River's condition	◒	• Alternative is 64% impervious area, increased over existing impervious area by 4.3 acres. • Shifted roadway allows for more effective area for implementation of best management practices. • Stormwater treated through BMPs prior to discharge will help improve the Taunton River's condition	◒	• Alternative is 57% impervious area, the same as the existing impervious area. • Shifted roadway allows for more effective area for implementation of best management practices. • Stormwater treated through BMPs prior to discharge will help improve the Taunton River's condition	●	• Alternative is 51% impervious area, decreased over existing impervious area by 3.9 acres. • Shifted roadway allows for more effective area for implementation of best management practices. • Stormwater treated through BMPs prior to discharge will help improve the Taunton River's condition
Emissions[3]	◇	<u>Total Corridor Emissions</u> CO - 6.55 kg NOx - 1.27 kg VOC - 1.52 kg <u>Total Regional Emissions</u> CO - 491,200 kg NOx - 8,984 kg VOC - 10,746 kg	◇	<u>Total Corridor Emissions</u> CO - 11.91 kg NOx - 2.31 kg VOC - 2.77 kg <u>Total Regional Emissions</u> CO - 491,500 kg NOx - 8,992 kg VOC - 10,756 kg	◇	<u>Total Corridor Emissions</u> CO - 21.19 kg NOx - 4.13 kg VOC - 4.91 kg <u>Total Regional Emissions</u> CO - 491,600 kg NOx - 8,990 kg VOC - 10,754 kg	◇	<u>Total Corridor Emissions</u> CO - 21.59 kg NOx - 4.21 kg VOC - 5.00 kg <u>Total Regional Emissions[4]</u> CO - 491,600 kg NOx - 8,990 kg VOC - 10,754 kg	◇	<u>Total Corridor Emissions</u> CO - 24.70 kg NOx - 4.79 kg VOC - 5.72 kg <u>Total Regional Emissions</u> CO - 491,500 kg NOx - 8,990 kg VOC - 10,753 kg

[3] PM Peak Hour emissions levels are provided
[4] Total Regional Emissions for Alternative 2 – Modified are assumed to be equivalent to those modeled for Alternative 2.

Table 4.33: Evaluation Matrix (Continued)

Category	Alternatives									
	Future No-Build		1 – Elevated Route 79 with Cross Connections		2 – At Grade Route 79 Boulevard		2 – Modified At Grade Route 79 Boulevard		3 – At Grade Route 79 with Frontage Roads	
	Rating	Discussion	Rating	Discussion	Rating	Discussion	Rating	Discussion	Rating	Discussion
LAND USE AND ECONOMIC DEVELOPMENT										
Economic Development Potential	◇	• Development potential is limited to existing parcels along Davol Street • Perpetuates riverfront barrier • Only east-west connection is at President Avenue	●	• Highest development potential • Complicated access to businesses for regional traffic • 3 new east-west connections improve access to businesses	●	• High development potential • Better local business access • 3 new east-west connections improve access to businesses	●	• High development potential • Better local business access • 3 new east-west connections improve access to businesses	○	• Low development potential • Creates the most open space, including parcel near Old Brightman Street Bridge • Parcels can be used for riverfront parking • 4 new east-west connections improve access to businesses
Socio-Economic and Fiscal Impacts[5]	◇	• Limited to developments on existing parcels along Davol Street	●	• 1,730 Jobs • 1,450 Housing Units • $54 Million Disposable Income • $3.5 Million Annual Property Taxes	●	• 1,550 Jobs • 1,300 Housing Units • $48 Million Disposable Income • $3.1 Million Annual Property Taxes	● [6]	• 1,550 Jobs • 1,300 Housing Units • $48 Million Disposable Income • $3.1 Million Annual Property Taxes	○	• 330 Jobs • 275 Housing Units • $10.3 Million Disposable Income • $665,000 Annual Property Taxes
COMMUNITY EFFECTS										
Pedestrian and Bicycle Accommodations	▬	• No provisions for bicyclists • Only east-west connection for pedestrians is at President Avenue • 4,900' of sidewalk • Pedestrian travel time from Lindsey Street to Bicentennial Park along President Avenue: 3.5 min	●	• Sidewalk or shared-use path is provided along Davol Streets and 4 east-west connecting roads providing access to the waterfront and South Coast Rail • Bicycle accommodations provided throughout the project limits • Extends shared-use path from Veterans Memorial Bridge to the waterfront and Turner Street • 5,300' of sidewalk • 8,100' of shared-use path • Pedestrian travel time from Lindsey Street to Bicentennial Park along President Avenue: 3.5 min	●	• Sidewalk or shared-use path is provided along Davol Streets and 4 east-west connecting roads providing access to the waterfront and South Coast Rail • Waiting to cross large Route 79 intersections increases pedestrian and bicycle delay • Bicycle accommodations provided throughout the project limits • Extends shared-use path from Veterans Memorial Bridge to the waterfront and Turner Street • 6,800' of sidewalk • 8,000' of shared-use path • Pedestrian travel time from Lindsey Street to Bicentennial Park along President Avenue: 4 min	●	• Sidewalk or shared-use path is provided along Davol Streets and 4 east-west connecting roads providing access to the waterfront and South Coast Rail • Bicycle accommodations provided throughout the project limits • Extends shared-use path from Veterans Memorial Bridge to the waterfront and Turner Street • 6,800' of sidewalk • 8,000' of shared-use path • Pedestrian travel time from Lindsey Street to Bicentennial Park along President Avenue: 4 min	●	• Sidewalk or shared-use path is provided along Davol Streets and 5 east-west connecting roads providing access to the waterfront and South Coast Rail • Waiting to cross large Route 79 intersections increases pedestrian and bicycle delay • Bicycle accommodations provided throughout the project limits • Extends shared-use path from Veterans Memorial Bridge to the waterfront and Turner Street • 5,800' of sidewalk • 8,200' of shared-use path • Pedestrian travel time from Lindsey Street to Bicentennial Park along President Avenue: 5 min

[5] All numbers are approximate
[6] Socio-Economic and Fiscal Impacts for Alternative 2 – Modified are assumed to be equivalent to those modeled for Alternative 2.

Table 4.33: Evaluation Matrix (Continued)

Category	Alternatives									
	Future No-Build		1 – Elevated Route 79 with Cross Connections		2 – At Grade Route 79 Boulevard		2 – Modified At Grade Route 79 Boulevard		3 – At Grade Route 79 with Frontage Roads	
	Rating	Discussion	Rating	Discussion	Rating	Discussion	Rating	Discussion	Rating	Discussion
COMMUNITY EFFECTS										
Local Connectivity	🟥	• No access provided from Brightman Street to Route 79 • Only east-west connection is at President Avenue	🟢	• 3 new two-way cross streets are constructed providing access to the waterfront and direct access to South Coast Rail • Converts Brightman Street to two-way road with access to NB Route 79 • Access from Brightman Street to SB Route 79 on-ramp via Lindsey Street and NB Davol Street	🟢	• 3 new two-way cross streets are constructed for access to the waterfront, NB and SB Route 79 and direct access to South Coast Rail • Converts Brightman Street to two-way road with direct access to and from NB Route 79 and access to SB Davol Street and SB Route 79	🟢	• 3 new two-way cross streets are constructed for access to the waterfront, NB and SB Route 79 and direct access to South Coast Rail • Converts Brightman Street to two-way road with direct access to and from NB Route 79 and access to SB Davol Street and SB Route 79	🟢	• 4 new cross streets are constructed for access to the waterfront, NB and SB Route 79 and direct access to South Coast Rail • Converts Brightman Street to two-way road with direct access to and from NB Route 79 and access to SB Davol Street and SB Route 79
Visual Impacts	🟥	• "Visual barrier" of Route 79 remains • No open land available for green space, landscaping, or redevelopment	⭕	• "Visual barrier" created by Route 79 is worsened by raised elevations • Roadway shift creates 10.1 acres for green space and redevelopment	🟢	• At-grade Route 79 removes "visual barrier" between Fall River and the waterfront • Roadway shift creates 10.6 acres for green space and redevelopment • Large median allows for boulevard type landscaping	🟢	• At-grade Route 79 removes "visual barrier" between Fall River and the waterfront • Roadway shift creates 14.6 acres for green space and redevelopment • Large median allows for boulevard type landscaping	🟢	• At-grade Route 79 removes "visual barrier" between Fall River and the waterfront • Roadway shift creates 15.0 acres for green space and minor redevelopment • Median between NB and SB Route 79 allows for landscaping
Construction Impacts	🟢	• No construction impacts	⬜	• Construction will likely require 3 major construction stages (Davol Street Construction, NB Route 79 Construction and SB Route 79 Construction) and 4 construction seasons due to construction of 10 bridges	⬜	• Construction will likely require 3 major construction stages and 3 seasons (Davol Street Construction, NB Route 79 Construction and SB Route 79 Construction) • Proposed Route 79 NB construction must occur under traffic and while maintaining all existing access to businesses, intersections and roadways	⬜	• Construction will likely require 3 major construction stages and 3 seasons (Davol Street Construction, NB Route 79 Construction and SB Route 79 Construction) • Proposed Route 79 NB construction must occur under traffic and while maintaining all existing access to businesses, intersections and roadways	⬜	• Construction will likely require 4 major construction stages (Davol Street Construction, NB Route 79 Construction, SB Route 79 Construction, and Ramp Construction) over 3 construction seasons • NB Route 79 must be constructed prior to NB Davol Street construction to maintain access to all roadways • Reconstruction of the southbound ramps along Route 79 and U.S. Route 6 will require complicated staging and potential detours

Table 4.33: Evaluation Matrix (Continued)

Category	Alternatives									
	Future No-Build		1 – Elevated Route 79 with Cross Connections		2 – At Grade Route 79 Boulevard		2 – Modified At Grade Route 79 Boulevard		3 – At Grade Route 79 with Frontage Roads	
	Rating	Discussion	Rating	Discussion	Rating	Discussion	Rating	Discussion	Rating	Discussion
COMMUNITY EFFECTS										
Environmental Justice - Job Accessibility versus Future No-Build	◇	• No impacts	◇	Number of Basic Jobs: EJ: -2.1% Non-EJ: -2.4% Number of Retail Jobs: EJ: -3.4% Non-EJ: -6.9% Number of Service Jobs: EJ: -3.0% Non-EJ: -1.9% Average Highway Time: EJ: -0.8% Non-EJ: 0.0%	◇	Number of Basic Jobs: EJ: -2.3% Non-EJ: -2.4% Number of Retail Jobs: EJ: -3.5% Non-EJ: -6.9% Number of Service Jobs: EJ: -3.3% Non-EJ: -2.0% Average Highway Time: EJ: -0.8% Non-EJ: -0.4%	◇ [7]	Number of Basic Jobs: EJ: -2.3% Non-EJ: -2.4% Number of Retail Jobs: EJ: -3.5% Non-EJ: -6.9% Number of Service Jobs: EJ: -3.3% Non-EJ: -2.0% Average Highway Time: EJ: -0.8% Non-EJ: -0.4%	◇	Number of Basic Jobs: EJ: -2.1% Non-EJ: -2.4% Number of Retail Jobs: EJ: -3.5% Non-EJ: -6.8% Number of Service Jobs: EJ: -3.1% Non-EJ: -1.8% Average Highway Time: EJ: -0.8% Non-EJ: -0.4%
Environmental Justice - Education and Healthcare Accessibility versus Future No-Build	◇	• No imapcts	◇	Number of College Enrollment Slots: EJ: 0.0% Non-EJ: 0.0% Number of Hospital Beds: EJ: -2.9% Non-EJ: -0.0%	◇	Number of College Enrollment Slots: EJ: 0.0% Non-EJ: 0.0% Number of Hospital Beds: EJ: -2.9% Non-EJ: -0.0%	◇ [7]	Number of College Enrollment Slots: EJ: 0.0% Non-EJ: 0.0% Number of Hospital Beds: EJ: -2.9% Non-EJ: -0.0%	◇	Number of College Enrollment Slots: EJ: 0.0% Non-EJ: 0.0% Number of Hospital Beds: EJ: -2.9% Non-EJ: -0.0%
Environmental Justice – Mobility versus Future No-Build	◇	• No imapcts	◇	Highway Production Time: EJ: 8.3% Non-EJ: 7.0% Highway Attraction Time: EJ: 1.3% Non-EJ: 1.2%	◇	Highway Production Time: EJ: 8.3% Non-EJ: 7.0% Highway Attraction Time: EJ: 1.3% Non-EJ: 1.2%	◇ [7]	Highway Production Time: EJ: 8.3% Non-EJ: 7.0% Highway Attraction Time: EJ: 1.3% Non-EJ: 1.2%	◇	Highway Production Time: EJ: 8.3% Non-EJ: 7.0% Highway Attraction Time: EJ: 1.3% Non-EJ: 1.2%
Environmental Justice - Environmental Impacts versus Future No-Build	◇	• No imapcts	◇	Vehicle-Miles Traveled: EJ: 4.6% Non-EJ: 3.8% CO per square mile: EJ: 4.3% Non-EJ: 3.7% $PM_{2.5}$ per square mile: EJ: 4.6% Non-EJ: 3.7%	◇	Vehicle-Miles Traveled: EJ: 0.5% Non-EJ: 3.1% CO per square mile: EJ: 0.2% Non-EJ: 3.1% $PM_{2.5}$ per square mile: EJ: 0.7% Non-EJ: 3.0%	◇ [7]	Vehicle-Miles Traveled: EJ: 0.5% Non-EJ: 3.1% CO per square mile: EJ: 0.2% Non-EJ: 3.1% $PM_{2.5}$ per square mile: EJ: 0.7% Non-EJ: 3.0%	◇	Vehicle-Miles Traveled: EJ: -2.0% Non-EJ: 0.6% CO per square mile: EJ: -2.0% Non-EJ: 0.6% $PM_{2.5}$ per square mile: EJ: -1.7% Non-EJ: 0.6%
COST										
Construction Cost	●	$0	■	$100 Million	▬	$55 Million	▬	$55 Million	▬	$55 Million

[7] Environmental Justice evaluations for Alternative 2 – Modified are assumed to be equivalent to those modeled for Alternative 2.

4.14.8 Alternatives versus Study Objectives

This transportation study began with particular objectives in mind. The alternatives are to meet the following criteria:

- Provide better multimodal connectivity between Fall River neighborhoods and the waterfront
- Enhance multimodal access to the future South Coast Rail station
- Balance local and regional mobility
- Improve and enhance safety conditions
- Increase opportunities for economic development and land use
- Minimize potential impacts to the environment and community

Table 4.34 provides an overall evaluation of how the Future No-Build and alternatives meet each of the study objectives. All alternatives were designed so that they would meet all objectives; however some alternatives meet the objectives better than others.

Table 4.34: Evaluation of Alternatives versus Study Objectives

Study Objective	Future No-Build	Alternative 1	Alternative 2	Alternative 2 Modified	Alternative 3
Provide better multimodal connectivity between Fall River and the waterfront	■	●	●	●	●
Enhance multimodal access to South Coast Rail	▬	●	●	●	●
Balance local and regional mobility	□	●	○	○	○
Improve and enhance safety conditions	□	●	●	●	●
Increase opportunities for economic development and land use	◇	◒	●	●	○
Minimize potential impacts to the environment and community	□	○	●	●	●

4.15 Federal Highway Administration Review

MassDOT and FHWA met in December 2013 and April 2014 to discuss the Route 79 / Davol Street Corridor Study. As a result of those meetings, the FHWA requested that a detailed assessment of the impacts of climate change, and in particular, rising sea levels within the project area; and to estimate the order of magnitude values of land currently within the State Highway Layout that would be transferred to the City of Fall River or private entities upon implementation of the various study alternatives. In

addition, FHWA requested that the elimination of Davol Street West north of President Avenue be considered for Alternative 2 - Modified.

4.15.1 Impact of Climate Change and Rising Sea Levels

Initially, the current Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) was examined. The GIS-generated FIRM for the project area is shown in Figure 4.22. This map has been adjusted to take into account the revised I-195/Route 79 Interchange Project which is currently under construction. The map has also been adjusted to indicate the areas of the existing Route 79 that are above the floodplain level. The current FIRM inaccurately shows the 100-year floodplain extending over Route 79 south of City Pier. Rather, the floodplain extends through the Cedar Street U-turn to Davol Street East while Route 79 itself remains elevated above the floodplain. This analysis also determined that Route 79 does not act as a flood barrier but rather channels floodwater to the openings under the embankment.

To assess the potential impacts of the rising sea levels, it was assumed that the future 100-year floodplain elevation will rise by 5 feet. It should be noted that this is a simple estimate based on studies done by others and the current available scientific data. For example, a study undertaken by National Oceanic and Atmospheric Administration (NOAA) as part of the 2012 National Climate Assessment Report estimated that a sea level rise between 0.2 and 2.0 meters (0.6 and 6.5 feet) could occur between the years 2000 and 2100. The scenarios developed by such studies do not necessarily predict future changes, but describe future potential conditions to help make rational decisions regarding design. The contours on the GIS map were interpolated to plot the potential revised floodplain levels with the potential 5-foot sea level rise, and these are also shown on the revised FIRM in Figure 4.22. As is evident from the map, the extent of this change is relatively insignificant due to the local topography. The map also shows three main land uses that are prevalent in the area: residential, commercial, and industrial. The areas that are within the current 100-year floodplain are primarily commercial and industrial zones along the waterfront. Residential areas are above this floodplain and would remain such even with the floodplain elevation raised by 5 feet.

The last step in this exercise was to evaluate the impacts of lowering Route 79 on the extents of the floodplain. The FIRM exhibit showing the revised floodplain while taking into account the adjusted Route 79 elevations proposed under Alternatives 2, 2 - Modified and 3 is shown in Figure 4.23. It shows that while a portion of Route 79 near and south of the City Pier would fall within the 100-year floodplain, a 5-foot rise in the sea level would have little impact.

Figure 4.22: Revised FIRM

Figure 4.22: Revised FIRM for Alternatives 2, 2 – Modified and 3

It should be noted that this analysis was conducted using topographic information from the GIS maps, based on interpolation between 10-foot contours. A more accurate examination may be warranted during the environmental analysis phase.

4.15.2 Valuation of Parcels within the State Highway Layout

As the City of Fall River has expressed a desire to redesign the Route 79 and Davol Street Corridor in a way that consolidates the existing transportation infrastructure while creating new developable parcels within the study corridor. This study has therefore made the promotion of economic development, both regionally and within the Focus Area a project objective. Each alternative creates five or six open parcels of land that are located wholly or partially within the right-of-way currently owned by MassDOT and referred to as the State Highway Layout (SHLO). The land within the SHLO that Route 79 currently occupies was funded by the federal government and federal guidelines require that the value of this land be reimbursed to the federal government if the land is repurposed or sold for non-transportation purposes.

In order to determine a conceptual value of this land, a price per acre of land was developed based on a synthesis of existing assessed values, recent waterfront sales comparisons and local and regional benchmark commercial properties. Lower and upper price ranges were established and applied to narrow (assumed to be less than 75 feet in width) and upper values were applied to wider, more desirable sites (over 75 feet in width) which are considered to have higher development potential. The estimated values are $200,000 per acre for narrow sites and $300,000 per acre for wide sites. Applying these rates to parcels under the various Route 79 alternatives yields the parcel values summarized in Table 4.35.

Table 4.35: Estimated Parcel Valuation

Alternative	Parcel Number	Parcel Type	Parcel Size (ac)	Estimated Value
Alternative 1	1	Wide	1.9	$570,000
	2	Wide	1.8	$540,000
	3	Narrow	1.2	$240,000
	4	Narrow	0.5	$100,000
	5	Wide	4.1	$1,230,000
	Alternative 1 Totals		9.5	$2,680,000
Alternative 2	1	Wide	1.2	$360,000
	2	Wide	1.4	$420,000
	3	Narrow	1.0	$200,000
	4	Narrow	2.1	$420,000
	5	Wide	4.2	$1,260,000
	Alternative 2 Totals		9.9	$2,660,000
Alternative 2 - Modified	1	Wide	2.2	$660,000
	2	Wide	1.6	$480,000
	3	Narrow	1.4	$280,000
	4	Wide	2.5	$750,000
	5	Wide	4.5	$1,350,000
	Alternative 2 - Modified Totals		12.2	$3,520,000
Alternative 3	1	Wide	1.9	$570,000
	2	Wide	2.1	$630,000
	3	Wide	1.5	$450,000
	4	Wide	2.9	$870,000
	5	Wide	2.2	$660,000
	6	Wide	3.5	$1,050,000
	Alternative 3 Totals		14.1	$4,230,000

4.15.3 Elimination of Davol Street West North of President Avenue

At the request of the FHWA, consideration was given to further revising Alternative 2 - Modified to eliminate Davol Street West north of President Avenue, which would in turn result in eliminating the ramps from Route 79 and Veterans Memorial Bridge to Davol Street West. The Davol Street West right-of-way would still be used for a shared-use path connecting Veterans Memorial Bridge and the neighborhoods to the waterfront. The issues associated with these modifications are discussed below.

4.15.3.1 Access from Veterans Memorial Bridge to Local Destinations

Elimination of the ramp from Veterans Memorial Bridge to Davol Street West would necessitate all traffic crossing the Taunton River from Somerset to use Route 79. Because of the proximity of this ramp merge with Route 79 to the proposed intersection with Cory Street, a left turn movement from the ramp onto Cory Street

would be prohibited in order to avoid a dangerous short weaving maneuver. As a result, traffic from Veterans Memorial Bridge would be forced to use the President Avenue intersection for access to the areas east of Route 79 adjacent to Brightman Street, a path similar to the current condition. This would put further strain on the intersection of Route 79 with President Avenue, which already has several movements forecasted to operate at LOS E or F under Alternative 2 – Modified.

4.15.3.2 Access to Brownell Street

Elimination of Davol Street West north of President Avenue would somewhat constrain access to Brownell Street, the only public street north of Battleship Cove connecting directly to the Taunton River waterfront. All Veterans Memorial Bridge and Route 79 traffic could only access Brownell Street via the intersection of Route 79 with President Avenue, again contributing to its congestion. The portion of Davol Street West between President Avenue and Brownell Street would still have to be maintained and be designated as a two-way roadway in order to maintain access.

4.15.3.3 Cory Street Access

As currently configured in Alternative 2 – Modified, Cory Street extends to Davol Street West, serving as one of the new east-west roadways connecting Fall River neighborhoods east of Route 79 to the waterfront. Eliminating Davol Street West would remove this connection, making westbound Cory Street only able to access the industrial complex driveway currently on the west side of Davol Street West. Unless this complex is acquired and rezoned in the future, the waterfront connectivity proposed via Cory Street would be lost.

4.15.3.4 Brightman Street Access

The current configuration of Alternative 2 – Modified provides for a direct connection from Brightman Street to Davol Street West and ultimately Route 79 via the U-turn structure presently connecting Davol Street East to Davol Street West. Removal of Davol Street West would eliminate this option. Access from Brightman Street to the south would be accomplished via local streets connecting to President Avenue, identically to the existing travel patterns. This could further exacerbate congestion at the intersection of Route 79 and President Avenue and would negate the benefits of restoring Brightman Street to two-way operation.

4.15.3.5 U-Turn Bridge From Davol Street East to Davol Street West

The curved bridge over Route 79 connecting Davol Street East to Davol Street West was recently constructed as part of the Veterans Memorial Bridge project. Alternative 2 – Modified eliminates the need for this connection between Davol Street East and Davol Street West; however, this bridge would carry Brightman Street traffic destined to the waterfront or points south. Elimination of Davol Street West would render this structure inaccessible to any vehicular traffic. It could, however, be retained for pedestrian or bicycle use.

4.15.3.6 Veterans Memorial Bridge Ramp Configuration

The current ramp from Veterans Memorial Bridge to Eastbound U.S. Route 6 and Southbound Route 79 is configured as a two-lane exit with the right lane providing access to Davol Street West and the left lane merging with Southbound Route 79. If the ramp to Davol Street were eliminated, these two lanes would be required to merge into a single lane prior to merging with Route 79 as the existing supports for the U-turn bridge connecting Davol Street East to Davol Street West do not provide enough width to accommodate a two-lane ramp from U.S. Route 6 alongside Southbound Route 79. This merge may become a hindrance to the eastbound Veterans Memorial Bridge traffic. However, the U-turn bridge would not be carrying any vehicular traffic under this scenario. If a decision were made to demolish the bridge, the ramp from the Veterans Memorial Bridge to Southbound Route 79 could be modified to maintain a two-lane ramp.

Finally, it is recognized that the suggested removal of a portion of Davol Street West is meant to reduce the overall amount of pavement and impervious area. However, this roadway would likely be replaced by internal circulation roads within developments, thus reducing or negating the benefits of this modification.

In summary, the elimination of Davol Street West would have a negative effect on the circulation and connectivity provided in Alternative 2 – Modified and would diminish the alternative's conformity to the study goals and objectives. Accordingly, it is recommended that Davol Street West be retained as currently proposed.

Route 79 / Davol Street Corridor Study

Chapter 5

Recommendations

5.1 Introduction

As defined in Chapter 1, the purpose of this study is to develop alternatives that will foster economic development along the Fall River waterfront while improving multimodal accessibility between the waterfront and the neighborhoods. The framework for accomplishing this purpose is identified through the study's goals and objectives, also enumerated in Chapter 1. The assessment of alternatives developed throughout the study was conducted with respect to their ability to achieve these goals and objectives. While alternatives that best meet these goals and objectives were determined in this study through a combination of analytical methods and an extensive public participation process, the policy context will aid in the decision making going forward. This Chapter contains recommendations for which alternatives should be advanced further, details the steps identified in the MassDOT Project Development and Design Guide, highlights the policy aspects of the project development process, and identifies the role of the City of Fall River as a partner in this process. This report concludes the planning process and sets the stage for advancing the study's recommendations into the project development phase.

The range of long-term alternatives that underwent detailed analysis[1] based on the Working Group input during the initial screening process includes the following:

Alternative 1- Elevated Route 79 with Cross Connections: This alternative relocates Route 79 to the east to open up land for development parcels, but maintains it as an elevated four-lane (two lanes in each direction) limited access highway. Three new cross connections are introduced under Route 79.

Alternative 2 - At-grade Urban Boulevard: Under this Alternative, Route 79 is shifted to the east to open up land for development parcels and lowered to approximately match elevations of the existing Davol Street. It is configured as a six-lane boulevard (three lanes in each direction separated by a landscaped median). Three new cross connections are introduced via signalized intersections in addition to improving and signalizing the existing cross connection at President Avenue.

Alternative 2-Modified - At-grade Urban Boulevard with Reduced Cross Section: This Alternative is similar to Alternative 2 with regard to its alignment and access. However, it features a reduced Boulevard cross section of four lanes (two lanes in each direction). It also limits the extent of Davol Street West to just maintaining access to local land uses, rather than a continuous north-south corridor featured under Alternative 2. The scaled down Route 79 cross section is independent of this feature and could be implemented with or without it.

Alternative 3 - At-grade Urban Boulevard with Frontage Roads: Similar to Alternative 2 Modified, it features a four-lane (two lanes in each direction separated by a landscaped median) Route 79 Boulevard with signalized intersections at three new cross connections. It also introduces one-way frontage roads on either side of Route 79 for local access.

All of these Alternatives meet the study goals and objectives to varying degrees. Table 5.1 illustrates the correlation between the long-term alternatives and the study goals and objectives. Chapter 4 details

[1] Analysis of Alternative 2-Modified was based on traffic projections and development scenario developed for Alternative 2. No additional travel demand modeling was performed for this alternative.

performance of each alternative and contains an Evaluation Matrix comparing various measures of effectiveness. This evaluation coupled with early and continuous community input and guided by the FHWA and MassDOT policies led to a determination that Alternatives 2 and 2-Modified would be the most advantageous in addressing the study goals and objectives. As such, these alternatives are recommended for advancing to the next step. Alternatives 2 and 2-Modified are illustrated in Figures 5.1 and 5.2. Figures 5.3 and 5.4 are three-dimensional renderings of Alternative 2.

Table 5.1: Long-Term Alternatives vs. Study Objectives

Study Objective	No-Build	Alternative 1	Alternative 2	Alternative 2 Modified	Alternative 3
Provide better multimodal connectivity between Fall River and the waterfront	■	●	●	●	●
Enhance multimodal access to South Coast Rail	▬	●	●	●	●
Balance local and regional mobility	□	●	○	○	○
Improve and enhance safety conditions	□	●	●	●	●
Increase opportunities for economic development and land use	◇	◒	●	●	○
Minimize potential impacts to the environment and community	□	○	●	●	●

LEGEND:	Some	Moderate	Substantial
Benefits	○	◒	●
Impacts	□	▬	▬
Neutral	◇		

In addition to the long-term alternatives, a number of short-term and medium-term alternatives are recommended for implementation. Although they do not fulfill the overall study goals and objectives, they improve safety and multimodal accessibility and can be implemented within a shorter time frame than the long-term alternatives due to lesser permitting and design requirements and lower construction costs. The following discussion outlines short-term and medium-term improvement recommendations and provides additional detail on selection of Alternatives 2 and 2-Modified.

Figure 5.1: Alternative 2

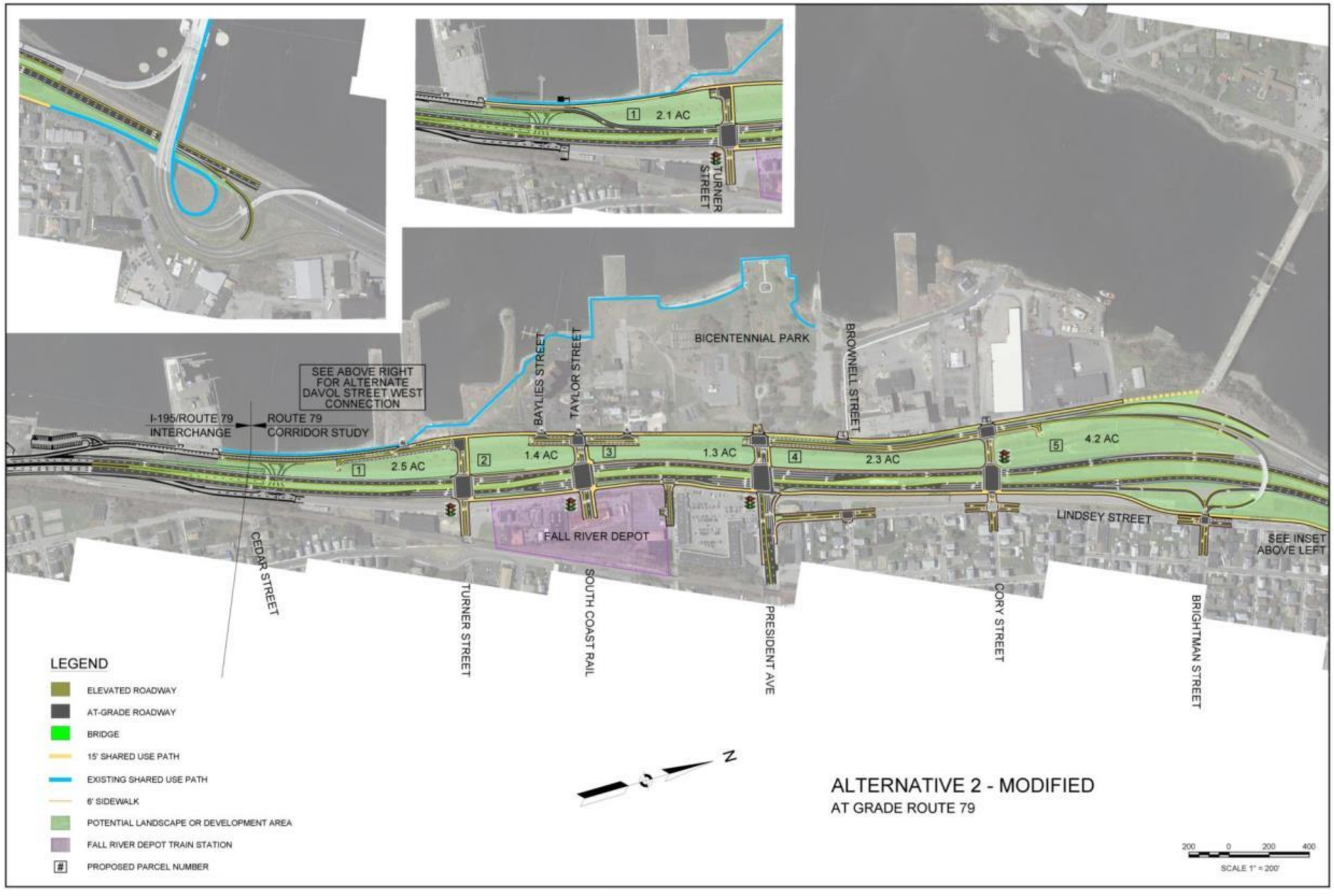


Figure 5.2: Alternative 2 – Modified

Figure 5.3: Rendering of Alternative 2 – Aerial View (Looking North)

Figure 5.4: Rendering of Alternative 2 – Street View (Davol Street Looking Northeast)

5.2 Alternatives Recommended for Advancement

Chapters 3 and 4 developed and analyzed through an iterative process a number of alternatives that could be implemented within the study area to meet the study goals and objectives. The development of alternatives began by evaluating individual locations with known safety and access deficiencies for pedestrians, bicyclists and vehicles. While "spot" improvements at these locations are possible, none of them fully satisfy all study goals and objectives; accordingly, a broader corridor-wide approach was required to meet all study objectives.

All alternatives presented in this study are categorized in one of three categories. The localized improvements are categorized as short-term and medium-term improvements, and the corridor-wide solutions are categorized as long-term alternatives. The short-term improvements could be accomplished with minimal levels of design and permitting, have relatively low costs, and, therefore, could be implemented in the near future. Medium-term improvements would require more significant levels of design and funding, which would slightly delay their implementation, making them a possibility within the next few years. The long-term alternatives, those that reconfigure the Route 79 and Davol Street corridor within the study area, will require the greatest levels of design, environmental permitting, complexity and funding, and have the longest timeframe for implementation.

5.2.1 Short-Term Improvements

Short-term improvements are recommended for implementation at the following five locations within the study area.

Davol Street U-turn near Cedar Street

At the U-turn near Cedar Street, it is recommended to trim back existing vegetation to improve sight distance along Davol Street West. In addition, pavement markings should be added to delineate Davol Streets West and East as well as the stop lines along the U-turn lanes. A sign indicating an upcoming merge should be relocated to provide sufficient warning distance. These modifications would meet the study objective of improving and enhancing safety conditions. While they fall into the short-term improvement category due to being relatively simple and economical, it is recommended to delay their implementation until the adjacent I-195/Route 79 interchange project is substantially completed in this area. The Cedar Street U-turn area is currently being used for detouring Route 79 traffic affected by the interchange construction and will be restored to its existing condition upon completion of that project.

President Avenue at Davol Street East and Lindsey Street Intersection

At the intersection of President Avenue and Lindsey Street, a "Do Not Block Intersection" box should be painted, along with signs alerting motorists to the presence of pedestrians placed in advance of and at the intersection. An unsignalized crosswalk and ADA compliant ramps should be added at this intersection. At the intersection of President Avenue and Davol Street East, accessible pedestrian signals and ramps should be installed across all legs of the intersection.

These improvements would meet the study objective of improving and enhancing safety conditions.

President Avenue at North Main Street

At the intersection of President Avenue and North Main Street, accessible pedestrian signals and ramps should be installed across all legs of the intersection. Along northbound and southbound North Main Street, exclusive left-turn lanes should be added. The traffic signal phasing and corresponding signal indications should be upgraded to provide exclusive left-turn phases for all approaches. These intersection modifications would meet the study objective of improving and enhancing safety conditions.

Lindsey Street at Brownell Street

At the intersection of Lindsey Street with Brownell Street, accessible pedestrian ramps should be installed at all legs of the intersection. New pavement markings and signage should be installed to emphasize crosswalks on all approaches and the stop lines on Lindsey Street. These additions to the intersection would meet the study objective of improving and enhancing safety conditions.

Davol Street Bicycle Accommodations

Davol Street West and Davol Street East should be restriped and should have new signs installed to provide bicycle lanes or bicycle accommodating shoulders along the outside lane. Along Davol Street West, the second through lane should be dropped south of President Avenue to maintain one through lane, one five-foot wide bike lane and one lane for parking. Along Davol Street East, between the Cedar Street U-turn and President Avenue, the outside shoulder should be restriped for bicycles. These modifications to Davol Streets West and East would meet the study objectives of improving and enhancing safety conditions, providing better multimodal connectivity between the neighborhoods and the waterfront, and offering multimodal access to South Coast Rail.

In addition to the specific locations described above, the City of Fall River is in the process of installing bike route signs along selected low volume / low speed local streets. Consistent with this initiative, it is recommended that bike route signs and "sharrow" pavement markings be installed along all streets connecting Wellington Street (current terminus of the Veterans Memorial Bridge shared-use path) and President Avenue to create designated easily identifiable bicycle access. Due to a number of one-way streets, the northbound and southbound bike routes would partially follow different paths. In the north-south direction, such a bike route would be comprised of the corridor formed by Wellington, Fulton, Brightman, Morton, George, and Lindsey Streets. In the reverse direction from south to north, this corridor would be somewhat more direct and would follow Lindsey, Brightman, Fulton, and Wellington Streets.

5.2.2 Medium-Term Improvements

A medium-term improvement that is recommended for implementation is partial reconstruction of Davol Street West south of President Avenue in order to provide a two-way shared-use path. This alternative would partially reconstruct Davol Street West to support one southbound through lane and one lane of parking. A shared-use path would be separated from the roadway by a grass buffer. This work could be accomplished by reallocating available space within the existing 37'-38' right-of-way obtained for an aerial image, but it should be verified by obtaining a detailed survey. This improvement would meet the study objectives of improving and enhancing safety conditions, providing better multimodal connectivity between the neighborhoods and the waterfront, and offering multimodal access to South Coast Rail. In order to maintain continuity of access, the implementation of this improvement should be coordinated with the I-195/Route 79 Interchange project which will include pedestrian and bicycle provisions on Davol Street West between Central Street and the northern project limits,

5.2.3 Long-Term Alternatives

Alternatives 2 and 2 – Modified are recommended for advancement to the next project phase as these two alternatives meet the study goals and objectives to the greatest extent and are supported by the community. Additionally, FHWA requires that a designated preferred alternative be determined as part of the project development process. More specifically:

- Both alternatives improve mobility, connectivity, and safety for all transportation modes and users by introducing three new and one improved east-west connections between Fall River and the waterfront, providing pedestrian and bicycle accommodations throughout the project limits, and by improving a number of high crash locations.
- Both alternatives promote and foster local and regional economic development potential by introducing new development parcels, providing efficient access to these and existing parcels for both regional and local vehicular and non-motorized traffic, and by connecting these parcels to the future South Coast Rail Fall River Depot train station.
- Both alternatives improve the quality of life for residents of surrounding neighborhoods and throughout Fall River by introducing safe multimodal accessible routes, eliminating physical and visual barrier formed by the elevated Route 79 and replacing it with an attractive urban boulevard. They restore Brightman Street to two-way operation, thus enabling access to Route 79 and eliminating excessive circulation through the neighborhood.

The further development of these alternatives will have to address certain design challenges. Alternative 2 introduces long pedestrian crossing distances across Route 79 and will require careful assessment of pedestrian interval lengths balanced with the desire to maintain efficient vehicular operation. Alternative 2 - Modified features shorter crosswalks, but potentially

increased level of congestion due to fewer through lanes. Intersection queuing and traffic signal coordination parameters will need to be thoroughly examined. Brightman Street connection to northbound Route 79 introduced under both alternatives will require a close examination of horizontal and vertical design elements to mitigate the difference in elevation of 20 feet between the two roadways.

While Alternatives 1 and 3 satisfy most of the study goals and objectives, they are not recommended for the following reasons:

- Alternative 1 does not support the goal of improving the quality of life to the same potential as Alternatives 2 and 2 – Modified as it retains the visual barrier created by the elevated Route 79 roadway. Also, it does not allow a direct connection from Brightman Street to southbound Route 79 and Davol Street. At a cost of almost double the cost of Alternatives 2 and 2-Modifed, it does not provide the most advantageous use of public funds.
- Alternative 3 does not fully support the goal of promoting and fostering economic development potential due to a less efficient roadway configuration, which limits the size of development that could be supported by the roadway infrastructure.

5.3 MassDOT Project Development and Design Process

Transportation decision-making is complex and can be influenced by legislative mandates, environmental regulations, financial limitations, agency programmatic commitments, and partnering opportunities. Project development is the process that takes a transportation improvement from conception through construction. Decision-makers and reviewing agencies, when consulted early and often throughout the project development process, can ensure that all participants understand the potential impact these factors may have on project implementation.

The MassDOT Highway Division has developed a comprehensive project development process which is contained in Chapter 2 of the *MassDOT Highway Division's Project Development and Design Guide*. The eight-step process covers a range of activities extending from identification of a project need, through completion of a set of finished contract plans, to construction of the project. The sequence of decisions made through the project development process progressively narrows the project focus, while developing greater design details, and ultimately leads to a project that addresses the identified needs in the most cost-effective and publicly acceptable way. The Route 79 / Davol Street Corridor Study has been structured to meet the first two steps of the project development process: I - Needs Identification and II - Planning. The more-detailed descriptions provided in the following sections are focused on the process for a roadway project, but the same basic process will need to be followed for non-roadway projects as well.

Step I: Needs Identification

For each of the locations at which an improvement is to be implemented, MassDOT leads an effort to define the problem, establishes project goals and objectives, and defines the scope of the planning

needed for implementation. To that end, it has to complete a Project Need Form (PNF), which states in general terms the deficiencies or needs related to the transportation facility or location. The PNF documents the problems and explains why corrective action is needed. For this study, the information defining the need for the project will be drawn primarily, perhaps exclusively, from the present report. Also, at this point in the process, MassDOT meets with potential participants, such as the Southeastern Massachusetts Metropolitan Planning Organization (MPO) and community members, to allow for an informal review of the project.

The PNF is reviewed by the MassDOT Highway Division District 5 office whose jurisdiction includes the location of the proposed project. MassDOT also sends the PNF to the MPO, for informational purposes. The outcome of this step determines whether the project requires further planning, whether it is already well supported by prior planning studies, and, therefore, whether it is ready to move forward into the design phase, or whether it should be dismissed from further consideration.

Step II: Planning

This phase will likely not be required for the implementation of the improvements proposed in this planning study, as this planning report should constitute the outcome of this step. However, in general, the purpose of this implementation step is for the project proponent to identify issues, impacts, and approvals that may need to be obtained, so that the subsequent design and permitting processes are understood.

The level of planning needed will vary widely, based on the complexity of the project. Typical tasks include: define the existing context, confirm the project need, establish goals and objectives, initiate public outreach, define the project, collect data, develop and analyze alternatives, make recommendations, and provide report documentation. Likely outcomes include consensus on the project definition to enable it to move forward into environmental documentation (if needed) and design, or a recommendation to delay the project or dismiss it from further consideration.

Step III: Project Initiation

At this point in the process the proponent, MassDOT Highway Division, completes a Project Initiation Form (PIF) for each improvement, which is reviewed by its Project Review Committee (PRC) and the MPO. The PRC is composed of the Chief Engineer, each District Highway Director, and representatives of the Project Management, Environmental, Planning, Right-of-Way, Traffic, and Bridge departments, and the Federal Aid Program Office (FAPO). The PIF documents the project type and description, summarizes the project planning process, identifies likely funding and project management responsibility, and defines a plan for interagency and public participation. First the PRC reviews and evaluates the proposed project based on the MassDOT's statewide priorities and criteria. If the result is positive, MassDOT Highway Division moves the project forward to the design phase and to programming review by the MPO. The PRC may provide a Project Management Plan to define roles and responsibilities for subsequent steps. The MPO review includes project evaluation based on the MPO's regional priorities and criteria. The MPO may assign project evaluation criteria score, a Transportation Improvement Program (TIP) year, a tentative project category, and a tentative funding category.

Step IV: Environmental Permitting, Design, and Right-of-Way Process

This step has four distinct but closely integrated elements: Public Outreach, Environmental Documentation and Permitting (varying levels, if required), Design, and Right-of-Way Acquisition (if required). The outcome of this step is a fully designed and permitted project ready for construction. The sections below provide more detailed information on the four elements of this step of the project development process.

Public Outreach

Continued public outreach in the design and environmental process is essential to maintain varying levels of public support for the project and to seek meaningful input on the design elements. The public outreach is often in the form of required public hearings (conducted at the 25% and 100% design milestones), but can also include less formal dialogues with those interested in and affected by a proposed project.

Environmental Documentation and Permitting

The project proponent, in coordination with the Environmental Services section of the MassDOT Highway Division, will be responsible for identifying and complying with all applicable federal, state, and local environmental laws and requirements. This includes determining the appropriate project category for both the Massachusetts Environmental Protection Act (MEPA) and the National Environmental Protection Act (NEPA). Environmental documentation and permitting is often completed in conjunction with the Preliminary Design phase described below.

Design

There are three major phases of design. The first is Preliminary Design, which is also referred to as the 25-percent submission. The major components of this phase include a full survey of the project area, preparation of base plans, development of basic geometric layout, development of preliminary cost estimates, and submission of a functional design report. Preliminary Design, although not required to, is often completed in conjunction with the Environmental Documentation and Permitting. The next phase is Final Design, which is also referred to as the 75% and 100% submission. The major components of this phase include preparation of a subsurface exploratory plan (if required), coordination of utility relocations, development of temporary traffic control plans through construction zones, development of final cost estimates, and refinement and finalization of the construction plans. Once Final Design is complete, a full set of Plans, Specifications, and Estimates (PS&E) is developed for the project.

Right-of-Way Acquisition

A separate set of Right-of-Way plans is required for any project that requires land acquisition or easements. The plans must identify the existing and proposed layout lines, easements, property lines, names of property owners, and the dimensions and areas of estimated takings and easements.

Step V: Programming (Identification of Funding)

Programming, which typically begins during the design phase, can actually occur at any time during the process, from planning to design. In this step, which is distinct from project initiation, the proponent requests that the MPO include the project in the region's Transportation Improvement Program (TIP) process. The proponent requesting the project's listing on the TIP can be the community or it can be one of the MPO member agencies (the Regional Planning Agency, MassDOT, and the Regional Transit Authority). The MPO then considers the project in terms of state and regional needs, funding availability, project readiness, evaluation criteria, and compliance with the Regional Transportation Plan and decides whether to place it in the Draft TIP for public review and then in the Final TIP. A project does not have to be fully designed in order for the MPO to program it in the TIP, but generally a project has reached 75-percent design to be programmed in the year-one element of the four-year TIP.

Step VI: Procurement

Following project design and programming of a highway project, the MassDOT Highway Division publishes a request for proposals, which is also often referred to as being 'advertised' for construction. MassDOT then reviews the bids, and awards the contract to the qualified bidder with the lowest bid.

Step VII: Construction

After a construction contract is awarded, MassDOT Highway Division and the contractor develop a public participation plan and a temporary traffic control plan for the construction process.

Step VII: Project Assessment

The purpose of this step is to receive constituents' comments on the project development process and the project's design elements. MassDOT Highway Division can apply what is learned in this process to future projects

Table 5.2 contains the summary of these steps along with their affect on the project schedule and lists approximate duration ranges associated with each step.

Table 5.2: Project Development Schematic Timetable

Description	Schedule Influence	Typical Duration
Step I: Problem/Need/Opportunity Identification The proponent completes a Project Need Form (PNF). This form is then reviewed by the MassDOT District office, which provides guidance to the proponent on the subsequent steps of the process.	The PNF has been developed so that it can be prepared quickly by the proponent, including any supporting data that is readily available. The District office shall return comments to the proponent within one month of PNF submission.	1 to 3 months
Step II: Planning Project planning can range from agreement that the problem should be addressed through a clear solution to a more-detailed analysis of alternatives and their impacts.	For some projects, no planning beyond preparation of the PNF is required. While other projects require a planning study centered on specific project issues associated with the proposed solution or a narrow family of alternatives. More complex projects will likely require a detailed alternatives analysis.	Project Planning Report: 3 to 24+ months
Step III: Project Initiation The proponent prepares and submits a Project Initiation Form (PIF) and a Transportation Evaluation Criteria (TEC) form in this step. The PIF and TEC are informally reviewed by the Metropolitan Planning Organization (MPO) and MassDOT District office, and formally reviewed by the Project Review Committee (PRC).	The PIF includes refinement of the preliminary information contained in the PNF. Additional information summarizing the results of the planning process, such as the Project Planning Report, is included with the PIF and TEC. The schedule is determined by PRC staff review (dependent on project complexity) and meeting schedule.	1 to 4 months
Step IV: Design, Environmental, and Right of Way The proponent completes the project design. Concurrently, the proponent completes necessary environmental permitting analyses and files applications for permits. Any right of way needed for the project is identified and the acquisition process begins.	The schedule for this step is dependent upon the size of the project and the complexity of the design, permitting, and right-of-way issues. Design review by the MassDOT District and appropriate sections is completed in this step.	3 to 48+ months
Step V: Programming The MPO considers the project in terms of its regional priorities and determines whether or not to include the project in its Draft Transportation Improvement Program (TIP) which is then made available for public comment. The TIP includes a project description and funding source.	The schedule for this step is subject to each MPO's programming cycle and meeting schedule. It is also possible that the MPO will not include a project in its Draft TIP based on its review and approval procedures.	3 to 12+ months
Step VI: Procurement The project is advertised for construction and a contract awarded.	Administration of competing projects can influence the advertising schedule.	1 to 12 months
Step VII: Construction The construction process is initiated including public notification and any anticipated public involvement. Construction continues to project completion.	The duration for this step is entirely dependent upon project complexity and phasing.	3 to 60+ months
Step VIII: Project Assessment The construction period is complete and project elements and processes are evaluated on a voluntary basis.	The duration for this step is dependent upon the proponent's approach to this step and any follow-up required.	1 month

Source: MassDOT Highway Division Project Development and Design Guide

The project development process described previously is based on a conventional project delivery method, commonly referred to as "Design-Bid-Build" (D-B-B). The essence of the D-B-B process is that project is designed to the PS&E level and then advertised for construction, i.e. the design and construction are carried out sequentially. Under this scenario the engineer of record (designer) and the construction contractor are two separate contracting entities. A schematic timeline illustrating this process is shown in Figure 5.5, and for the purpose of this discussion assumes aggressive durations and that construction funding would be available at the end of the design phase.

Route 79 / Davol Street Corridor Project (Conventional Delivery Method)

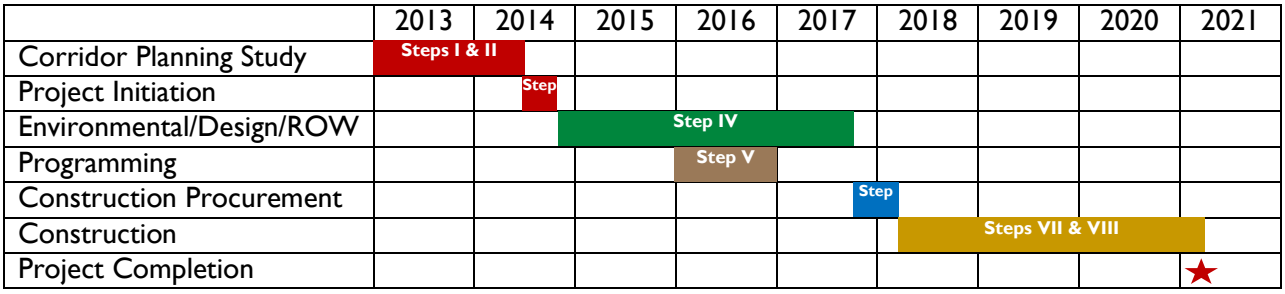


Figure 5.5: Schematic Implementation Timeline for a Design-Bid-Build Project

Another project delivery method gaining increasing support and becoming more and more common is "Design-Build" (D-B). Massachusetts General Laws allow the use of D-B for the construction, reconstruction, alteration, remodeling, and repairs of a public works project estimated to cost not less than $5,000,000.00[2]. The main difference between the D-B-B and the D-B delivery methods is that the project proponent (MassDOT) contracts with the D-B entity which is responsible for design and construction. Such an arrangement allows overlapping design and construction activities and results in accelerated project schedule. Typically, Steps I, II, and III are completed prior to initiating the D-B procurement. Step IV is modified: it still includes the environmental permitting and right-of-way acquisition; however, the design is carried out only to the 25% level. Final design is performed by the D-B entity. Due to the lesser level of design, the duration of Step IV is reduced, but the procurement phase which includes preparation of the bid may take longer than under the D-B-B process. The overall project schedule, however, and especially start of construction are accelerated. Figure 5.6 illustrates the schematic timeline for a D-B project delivery.

Route 79 / Davol Street Corridor Project (Design-Build Delivery Method)

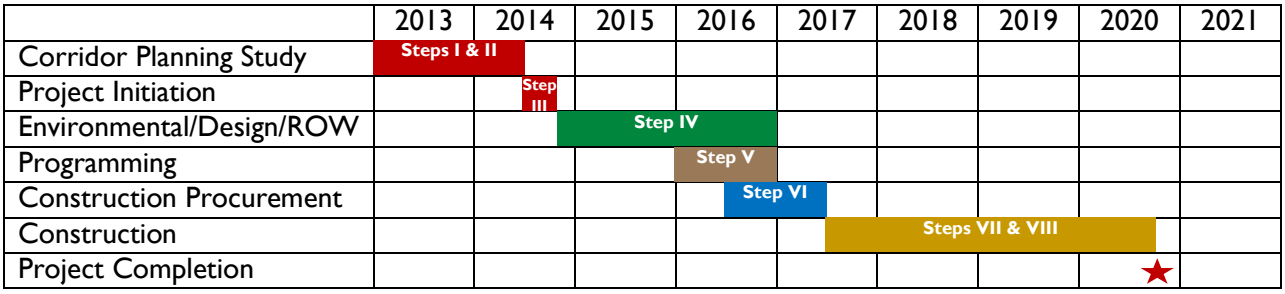


Figure 5.6: Schematic Implementation Timeline for a Design-Build Project

[2] MassDOT Design Build Procurement Guide, December 1, 2012.

Comparison of the two schedules shows that the D-B process could potentially allow construction to start six to twelve months earlier than the D-B-B method. This gain in schedule is somewhat diminished due to a longer construction process which would have to allow time for some design activities to take place before commencement of construction, but the overall project duration is still likely to be reduced by 6-12 months.

5.4 Environmental Considerations

Going forward, in the Environmental Permitting and Design phases, any proposed corridor improvements must comply with the National and Massachusetts Environmental Policy Acts and the Wild and Scenic Rivers Act, as well as take into account the potential impacts of climate change and the necessity of evacuation routes.

5.4.1 Environmental Policy Acts

The project proponent, in coordination with the Environmental Services section of the MassDOT Highway Division, will be responsible for identifying and complying with all applicable federal, state, and local environmental laws and requirements. This includes determining the appropriate project category for both the Massachusetts Environmental Policy Act (MEPA) and the National Environmental Policy Act (NEPA). Environmental documentation and permitting is often completed in conjunction with the Preliminary Design phase.

NEPA does not establish any quantitative thresholds for the environmental classification of a transportation improvement project. Transportation projects vary in type, size and complexity, and potential to affect the environment. The effects of such projects can vary from very minor to significant impacts on the human environment. To account for the variability of project impacts, three basic "classes of action" are allowed and determine how compliance with NEPA is carried out and documented:

- An Environmental Impact Statement (EIS) is prepared for projects where it is known that the action will have a significant effect on the environment.
- An Environmental Assessment (EA) is prepared for actions in which the significance of the environmental impact is not clearly established. Should environmental analysis and interagency review during the EA process find a project to have no significant impacts on the quality of the environment, a Finding of No Significant Impact (FONSI) is issued.
- Categorical Exclusions (CEs) are issued for actions that do not individually or cumulatively have a significant effect on the environment.

The MEPA process includes eleven review thresholds that identify categories for projects that are likely to cause damage to the environment. These review thresholds determine whether MEPA review is required. MEPA review is required when one or more review thresholds are met or exceeded and the subject matter of at least one review threshold is within MEPA jurisdiction. A review threshold that is met or exceeded also specifies whether MEPA review

shall consist of an Environmental Notification Form (ENF) and a mandatory Environmental Impact Report (EIR) or of an ENF and other MEPA review if the Secretary of the Executive Office of Energy & Environmental Affairs so requires.

The project will require preparation and filing of an ENF. The ENF criteria may be triggered by creating five acres of new impervious surface (more likely for Alternative 2 than Alternative 2 - Modified), a possible impact to endangered species within the Taunton River in case the roadway drainage system requires a new outfall, potential cutting of five 14-inch public shade trees, and will be definitely be triggered by construction of a new one-quarter mile long roadway or widening of an existing roadway for a distance of one-half mile.

The initial assessment of the MEPA review thresholds indicates that most likely the project will not meet or exceed any of the EIR requirements. As currently envisioned, neither of the recommended alternatives would involve the construction of greater than ten acres of new impervious surface or the construction of a new roadway or widening of an existing roadway for two miles.

The alternatives reconfigure and consolidate Route 79, Davol Street West and Davol Street East while introducing new roadways at east-west connections. This design results in a change in the overall impervious area within the Focus Area. The following estimates of the changes in impervious surface areas are based on conceptual designs suitable for planning purposes only. Additional engineering design details will be developed during the project development phases and these estimates are subject to change. Currently, there are roughly 35.0 acres of impervious surface within the Focus Area. The reconfiguration of Route 79 and the introduction of east-west roadways in Alternative 1 would increase impervious surface areas by 1.5 acres. The consolidation of existing roadways in Alternative 2 would provide a decrease of 2.5 acres while Alternative 2 – Modified would further decrease impervious surfaces by 6.8 acres. Alternative 3 would decrease impervious areas by 5.5 acres.

For the Route 79 / Davol Street Corridor Study, the following MEPA review thresholds that may require an ENF or an EIR were evaluated:

1. Land

- EIR
  - Direct alteration of 50 or more acres of land (that is not now disturbed) (there are only approximately 15 acres of land within the project area that are currently not disturbed)
  - Ten or more acres of new impervious surface (none of the alternatives considered would exceed this threshold, based on the current conceptual designs)
- ENF
  - Alteration of 25 acres of land (not now disturbed)
  - Five or more acres of new impervious surface (see above)

- Article 97 land impacts (public lands with natural resources)
- Urban redevelopment project with 100 or more new dwelling units or 50,000 square feet of new non-residential space

2. State listed endangered species

- ENF
  - Alteration of designated significant habitat, or more than two acres of impact to priority habitat. The only state listed endangered species habitat within the project limits is within the Taunton River. It is highly unlikely that any proposed improvements would be determined to have a negative impact on such species, although review with the Natural Heritage Endangered Species Program (NHESP) will be required.

3. Wetlands

- None of the thresholds established for wetland impacts will be exceeded if this project is implemented.

6. Transportation

- EIR
  - Construction of a new roadway two or more miles in length
  - Widening of an existing roadway by one or more travel lanes for two or more miles
- ENF
  - Construction of a new roadway one-quarter mile long or widening of an existing roadway by 4 or more feet for one-half mile or more
  - Cut 5 or more living public shade trees whose diameter is 14" or greater
  - Generation of 2,000 or more new ADT, or 1,000 or more ADT with 150 new parking spaces
  - Construction of 300 or more new parking spaces

10. Historic and Archeological Resources

- ENF
  - Demolition of a historic structure or archeological site

Several MEPA thresholds do not apply to this project. These are: Water, Wastewater, Energy, Air, Solid and Hazardous Waste, Areas of Critical Environmental Concern (ACEC), and Regulations.

5.4.2 Floodplain Impacts and the Potential for Sea Level Rise

As discussed in Chapter 4, a preliminary assessment was undertaken to examine the potential impacts of rising sea levels. To do this, the existing FEMA Flood Insurance Rate Map (FIRM),

dated July 7, 2009, was examined within the study area. The GIS-generated FIRM for the project area is shown in Figure 5.7. The map was adjusted to take into account the revised I-195/Route 79 Interchange Project, currently under construction. Based on observations, it appears that the floodplain extends through the Route 79 underpass near Cedar Street to the area east of Route 79, while Route 79 itself remains above the floodplain. The Route 79 embankment does not act as a flood barrier, but it does appear to channel the flow to the openings under the embankment during flood conditions.

To assess the potential impacts of rising sea levels, it was assumed that the 100-year floodplain elevation will rise by an average of five feet. Figure 5.7 includes a revised 100-year floodplain boundary with an elevation increase of five feet. Due to the local topography, the extent of this change is relatively insignificant to the majority of the City of Fall River to the east. The map also shows three primary land uses that are prevalent in the area: residential, commercial, and industrial. The areas that are within the estimated future 100-year floodplain, which include the potential 5-foot sea level rise, are primarily commercial and industrial zones along the waterfront. Residential areas are above this floodplain and would remain such even with the floodplain elevation was raised by five feet.

The last step in this exercise was to evaluate the impacts of lowering Route 79 relative to the limits of the 100-year floodplain. A revised FIRM indicating the potentially revised floodplain, taking into account the adjusted Route 79 elevation proposed under Alternatives 2 and 2 – Modified is shown in Figure 5.8. It shows that while a portion of Route 79 just south of the City Pier would fall within the estimated future floodplain, a 5-foot rise in the sea level would have little impact.

Because the project area is located within an area subject to flooding and potential sea level rise, it is recommended that the project development process examine flooding implication in much greater detail. As the design of the roadway improvements progresses a detailed analysis of the potential for an anticipated rise in flood levels will need to be developed. Also, any proposed new development within the existing floodplain and/or adjacent to the Taunton River will need to consider existing and projected flood levels during the early planning, permitting and design phases.

Figure 5.7: GIS Generated FIRM

Figure 5.8: Revised GIS Generated FIRM with Alternative 2 and Alternative 2 – Modified Elevations

5.4.3 Wild and Scenic Rivers Act

The Taunton River at this location is designated as a component of the National System of Wild and Scenic Rivers in accordance with the Wild and Scenic Rivers Act, which is administered by the National Park Service (NPS). Rivers, or segments of a river, are classified as wild, scenic or recreational. The section of the Taunton River within the project study area is classified as recreational. The recreational classification is used for those rivers or sections of rivers that are readily accessible, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past. Regardless of classification, each river in the National System is administered with the goal of protecting and enhancing the values that caused it to be designated. Designation neither prohibits development nor gives the federal government control over private property. Recreation, agricultural practices, residential and business development, and other uses may continue.

The NPS requires review of water resource projects when they are federally funded, permitted or assisted projects. This project will likely be partially federally funded and will also likely require a permit from the US Army Corps of Engineers (ACOE) for the potential design changes to a stormwater outfall structure located near the City Pier. The official NPS review will take place at the time of the ACOE permitting. Early communication benefits the review process and a representative from the NPS Wild and Scenic Rivers program has been actively involved as a member of the Working Group during the development of this planning study.

It is recommended that coordination with the NPS continue as the project development phases are developed. The Act encourages protection of the river but at the same time also encourages people to learn about and appreciate the attributes that warrant such protection, and to recognize the river's value as a recreational and ecological resource. As the project moves through the project development phase the consideration for both the protective measures and the increased awareness for the river's attributes should continue.

5.4.4 Evacuation Routes

The Southeastern Massachusetts Metropolitan Planning Organization (SMMPO) and the Southeastern Regional Planning and Economic Development District (SRPEDD) issued a study in 2006 entitled "Hurricane Evacuation Route Evaluation" which includes the study area. The Hurricane Evacuation Route Evaluation identified issues that may inhibit safe and effective traffic flow during an emergency. These issues include:

- Evacuation Route Conflicts
- Storm Surge Flooding
- Community Issues (shelters)
- Road System Impacts
- Evacuation Population and Traffic.

Under the category of "Road System Impacts" this study states that: "Major roads potentially impacted in Mount Hope Bay communities from a hurricane storm surge include I-195, U.S. Route 6, Route 103, Route 136, Route 138, and Route 79".

The study further determined that impacts to the city of Fall River would be primarily contained to those areas along the banks of the Taunton River, which would include portions of the project study area. Potential flooding would impact Route 79, Davol Street (East and West), and Route 138 in the area under the Braga Bridge. The study noted that Route 79 north of Brightman Street Bridge may also experience significant flooding due to the close proximity to the Taunton River. It should also be noted that Route 79 is identified as a Massachusetts Evacuation Route, and the proposed Route 79/Davol Street Corridor improvements are listed as a future project.

It is recommended that the potential for storm events adversely affecting evacuation routes be given further consideration during the project development phases. Consultation with the SMMPO and SRPEDD is recommended during the project development phase. As sea level rise and potential for an increase in the frequency and intensity of severe storm events is studied further by agencies such as NOAA it is possible that these evacuation routes may require modifications or at least further evaluation.

5.5 Policy Context

The Route 79 / Davol Street Corridor study has also been conducted in the context of transportation policy and planning principles that are significantly different from those that were in place when Route 79 and Davol Streets East and West were built. The planning environment for infrastructure in Massachusetts and around the country has changed, in terms of evolving policy positions and in local and regional priorities and the Goals, Objectives, and Evaluation Criteria were developed with the intent of aligning with these policy directives. The recommendations for this study were not determined strictly by how much vehicular traffic can be moved, but were also developed in accordance with the following state and Federal policies and regulations:

- MassDOT's GreenDOT Policy and the GreenDOT Implementation Plan, which embraces the goals that will include the design of a multi-modal transportation system, promote healthy transportation and livable communities, and to triple the share of travel demand by bicycling, transit, and walking.
- MassDOT's Complete Streets Policy requires balancing the use of the public right-of-way for all transportation modes, requires that MassDOT projects provide safe and accessible options for all travel modes for all ages and abilities, and emphasizes a multi-modal philosophy.
- The Massachusetts Healthy Transportation Compact and MassDOT's Healthy Transportation Policy Directive, an agreement between MassDOT, Massachusetts Health and Human Services, the Secretary of Energy and Environmental Affairs, and the Massachusetts Department of Public Health, requires that all MassDOT projects not only accommodate, but actively promote healthy transportation modes. This legislation is designed to facilitate transportation decisions that balance the needs of all users, expands mobility, improves public health and supports a cleaner environment.

- Federal regulations include Moving Ahead for Progress in the 21st Century (MAP-21) which is FHWA's national surface transportation plan, that, among many other things, seeks to increase the emphasis on non-auto users and encourages opportunities for alternative travel modes including transit, bicycle and pedestrian.

All of these policies reflect the fact that roadways are part of an infrastructure that must serve all users, while being an integral part of the surrounding neighborhoods. Providing access for all modes and travelers, considering vulnerable roadway users, enhancing transportation choices, fostering community connectivity and economic development, and ensuring the public health of adjoining residents are important considerations that are recognized through the policies and initiatives described above.

The Route 79/Davol Street Improvements will implement these goals, themes, policies and regulations by:

- Allowing for increased green space
- More trees in the median, along each side of Route 79, along the east side of Davol Street West, and along each side of the east-west connecting roads
- Improved bicycle and pedestrian access
- Improved access to bus and rail facilities

MassDOT's GreenDOT Policy and the GreenDOT Implementation Plan

More trees, grass, and other vegetation will not only improve aesthetics but would also be one step closer to better air quality, will provide more shade during the warmer months, and will improve opportunities for urban wildlife habitat. The shade provide by additional trees benefit the human population by providing a respite from the sun and also by reducing the heat absorbed and transmitted by paved areas. All of these benefits enhance the community in tangible ways but also provide a better living experience for residents, businesses, visitors and the traveling public.

The Massachusetts Healthy Transportation Compact and MassDOT's Healthy Transportation Policy Directive

Under existing conditions, the only designated east-west access for pedestrians and bicyclists is at President Avenue. Since the project will include additional east-west connections, the waterfront and the Harborwalk will become much more accessible. The project will include sidewalks or shared-use paths along each side of all roadways. The current concepts indicate all of the pedestrian paths running parallel to the roadway. As the design of the project progresses, these paths, which include both the sidewalk and shared-use path, could be designed to meander through designed landscaping features (not yet designed) and along and between any future developments, assuming there is adequate space to accommodate meandering paths.

As discussed in more detail in Chapter 2 of this document, the 2012 Regional Transportation Plan issued by SRPEDD proposes the creation of the South Coast Bikeway. This regional route would connect a number of existing and proposed bicycle paths and on-road bike routes. This route would include the existing bicycle path on the Veterans Memorial Bridge, the existing Quequechan River Greenway and its

planned extension, and a future connection between the two. It is therefore recommended that proposed improvements to bicycle access and facilities include close coordination with stakeholders, including SRPEDD, as the Route 79/Davol Street project moves through the project development phases. Such coordination will help ensure that the proposed connectivity for bicycles is consistent with other regional plans such as the South Coast Bikeway.

National Highway System

As discussed in Chapter 2, The National Highway System (NHS) consists of roadways essential to national economics, defense and mobility. The NHS includes interstates, principal arterials, and intermodal connectors. Route 24, Route 79 and President Avenue are classified on the NHS as Other Roads. U.S. Route 6 and President Avenue between Davol Street West and Davol Street East are considered as Urban Principal Arterials. I-195 is classified as an Interstate while Route 24 and Route 79 have the functional classification of Principal Arterial. Davol Street East, Davol Street West, Turner Street and Brightman Street are considered Urban Minor Arterials. All other roadways are local roadways.

The FHWA has oversight responsibility for the NHS and would be required to review design changes as they relate to the functional classification of the roadway. MassDOT will need to continue to coordinate with the FHWA, the City of Fall River and the Southeastern Massachusetts Metropolitan Planning Organization throughout the project development phases as it relates to any potential changes in the functional classification of any of the roadways within the project limits.

Transit, South Coast Rail, and the Southeastern Massachusetts MPO

The project will also improve access to bus facilities and identifies potential modifications to existing bus routes that will enhance bus service within the project limits. The project will improve access to the South Coast Rail Fall River Depot station, which is within the project limits. There are two Southeastern Regional Transit Authority (SRTA) bus routes in the area that could be modified when the project is built or when the proposed South Coast Rail project is completed, improving access to multi-modal transportation. SRTA Bus Route 2 runs along North Main Street and also provides a bus stop at Commonwealth Landing. This route could easily be modified to include another stop at the Fall River Depot. SRTA Bus Route 14 crosses the Braga Bridge to access their main bus terminal. This route could also be changed to provide access from Somerset to the proposed South Coast Rail, although it would be more difficult to reroute because the Fall River Depot station is further removed from this route.

The South Coast Rail Corridor Plan Update (December 2013) prepared by SRPEDD and others, updated areas within the South Coast Rail Corridor where communities would like to see growth (Priority Development Areas - PDAs) and areas they would like to preserve (Priority Protection Areas - PPAs). The purpose of identifying these priority areas was to target public investments, focus planning activities, and catalyze private development within a coordinated framework. Within the Focus Area, Fall River Depot was cited as a community priority area of regional significance. The Focus Area is also located within the Fall River Waterfront and Transit Oriented Development (WTOD) district which is geared towards transit oriented development but also includes commercial and industrial development associated with the waterfront along with mixed-use potential. The WTOD district was

also cited for its regional significance because of its location in close proximity to the proposed South Coast Rail Station site.

It is recommended that the project proponents continue to coordinate closely with the South Coast Rail project proponents as well as SRPEDD throughout the project development process, particularly since the SCR and proposed development along the waterfront district have been identified for their regional significance.

The Southeastern Massachusetts MPO is a transportation policy-making organization made up of representatives from local government and transportation authorities. MPOs were created to ensure that existing and future expenditures for transportation projects and programs were based on a continuing, cooperative and comprehensive (3-C) planning process. Federal funding for transportation project and programs are channeled through this process. As this project moves through the project development phases, coordination with the SMMPO will be required to request and allocate funding and to ensure that the project is consistent with other regional and local transportation programs and projects.

5.6 Role of the City of Fall River

As the alternatives are developed further, it is also recommended that the City of Fall River initiate a master planning process for the development of the study area. The master plan will build on the 2002 Fall River Harbor and Downtown Economic Development Plan and should be prepared concurrently with the Route 79/Davol Street Corridor environmental process to ensure a true partnership between Fall River and MassDOT. The development of the master plan is paramount to establishing the final roadway configuration. As such, the master plan needs to define the development size and mix that is compatible with the proposed roadway system and should address the means of reducing vehicular demand through such measures as Transportation Demand Management (TDM) and encouragement of transit use. It is anticipated that it will be a mixed-use development fully supporting internal trips and promoting walking and bicycling.

5.7 Additional Cost Considerations

The long-term alternatives developed in this study would create new parcels that could be repurposed or sold for public or private non-transportation purposes. Many of these parcels are located wholly or partially within the State Highway Layout. As this State Highway Layout was funded by the federal government, the value of the land must be reimbursed to the federal government if it is repurposed or sold for non-transportation services.

Table 5.3 provides conceptual values of parcels created for development in Alternatives 2 and 2 – Modified that would fall within the existing State Highway Layout. These estimated values do not reflect fair market value analysis. They are based on a synthesis of existing assessed values, recent waterfront sales comparisons and local and regional benchmark commercial properties. Accordingly, this analysis does not aim to provide an accurate estimation of land value, but is rather intended to illustrate order

of magnitude right-of-way costs and provide a comparative assessment of these costs between the two recommended alternatives.

Table 5.3: Estimated Parcel Valuation

Alternative	Parcel Number	Parcel Type	Parcel Size (ac)	Estimated Value
Alternative 2	1	Wide	1.2	$360,000
	2	Wide	1.4	$420,000
	3	Narrow	1.0	$200,000
	4	Narrow	2.1	$420,000
	5	Wide	4.2	$1,260,000
	Alternative 2 Totals		9.9	$2,660,000
Alternative 2 - Modified	1	Wide	2.2	$660,000
	2	Wide	1.6	$480,000
	3	Narrow	1.4	$280,000
	4	Wide	2.5	$750,000
	5	Wide	4.5	$1,350,000
	Alternative 2 - Modified Totals		12.2	$3,520,000

The process by which these parcels are sold would be conducted by MassDOT's Office of Real Estate and Asset Development. Upon completion of the construction phase, areas of the project that are no longer used for transportation purposes within the SHLO would be identified as surplus parcels, and may be available for disposition (sale, lease, license, easement, etc.), and would be governed by Mass General Law, Chapter 6C, as amended, and M.G.L Chapter 81, as well as administrative requirements set forth by the FHWA. This disposition process requires an internal canvass of other sections of MassDOT, in order to be certain the property is no longer needed for future MassDOT highway and railway projects. It would also require an open bidding process through a Request for Proposal, with the property appraised for its highest and best use. All expenses incurred by these outside services are born by the proponent of this action, or by an alternative party who is subsequently awarded the property through the RFP process.

To promote development of these parcels, public-private partnerships could be formed using District Improvement Financing (DIF) or Tax Increment Financing (TIF). DIF and TIF provide opportunities for cities to redevelop areas in order to increase property values and tax revenue, improve infrastructure and transportation services, and increase jobs, housing and quality of life.

5.8 Summary of Recommended Alternatives

Table 5.4 presented below contains a summary of short-term, medium-term and long-term recommendations. Along with brief alternatives descriptions, the information includes major milestones to be addressed by the project proponent and parties responsible for their implementation. Also included are order of magnitude costs, encompassing permitting, engineering, right-of-way, and construction costs.

Table 5.4: Summary of Recommended Alternatives and Major Milestones

Recommended Improvement	Description	Major Milestones	Responsible Party	Implementation Cost
Short-Term				
Davol Street U-turn near Cedar Street	• Trim vegetation • Install pavement markings and signs	• Implement upon substantial completion of I-195/Route 79 Interchange	City of Fall River	$9,000
President Avenue at Davol Street East and Lindsey Street	• Upgrade pedestrian signals to ADA standards • Install pavement markings and signs • Install ADA compliant accessible ramps	• Perform engineering • Procure and complete construction	City of Fall River	$55,000
President Avenue at North Main Street	• Modify traffic signals to introduce protected left turn phases • Upgrade pedestrian signals to ADA standards • Install ADA compliant accessible ramps • Install pavement markings and signs	• Perform engineering • Procure and complete construction	City of Fall River	$89,000
Lindsey Street at Brownell Street	• Install pavement markings and signs • Install ADA compliant accessible ramps	• Perform engineering • Procure and complete construction	City of Fall River	$22,000
Davol Street Bicycle Accommodations	• Install pavement markings and signs	• Implement upon substantial completion of I-195/Route 79 Interchange	City of Fall River	$22,000

Table 5.4: Summary of Recommended Alternatives and Major Milestones (continued)

Recommended Improvement	Description	Major Milestones	Responsible Party	Implementation Cost
Medium-Term				
Davol Street Shared-Use Path	• Reconstruct sidewalk and install new curb • Install grass strip • Relocate drainage structures • Resurface Davol Street • Install pavement markings and signs	• Initiate project development: prepare and submit PNF and PIF • Coordinate with SRPEDD to include project in the region's TIP • Obtain survey • Complete environmental permitting and engineering • Procure and complete construction	City of Fall River	$1,320,000
Long-Term				
Alternative 2 and Alternative 2 - Modified	• Demolish existing Route 79 • Construct at-grade Route 79 • Construct new cross streets • Construct sidewalks and shared-use paths • Install traffic signals • Perform other related work, including drainage, utilities, landscaping, connections to local streets	• Prepare and submit PNF, PIF and TEC • Determine NEPA and MEPA review requirements • Coordinate with SRPEDD to include project in the region's TIP • Coordinate with FHWA regarding Route 79 being part of NHS • Coordinate with City of Fall River regarding study area master plan • Coordinate with South Coast Rail on access to Fall River Depot	MassDOT	$66,500,000

Table 5.4: Summary of Recommended Alternatives and Major Milestones (continued)

Recommended Improvement	Description	Major Milestones	Responsible Party	Implementation Cost
Alternative 2 and Alternative 2 - Modified		• Coordinate with SRTA regarding options of modifying bus routes • Complete environmental permitting and preliminary engineering • Determine project delivery method • Procure and complete final design and construction		

5.9 Alternatives Refinement Considerations

In addition to the alternatives recommended for advancement, a number of other issues evolved or have been brought up by various stakeholders during the planning process. These issues warrant futher consideration and are listed below.

Coordination/Consultation

- Consultation with FHWA regarding use of available federal earmark funds for project development
- Coordination with FHWA on NHS designation impacts
- Coordination with South Coast Rail and SRTA regarding incorporation of bus shelters and access to transit station stops into the roadway design
- Coordination with South Coast Rail project regarding incorporation of Electric Vehicle charging stations in the parking facilities

Project Development

- Additional travel demand modeling for Alternative 2 – Modified
- Opportunities to further reduce the extent of impervious pavement surfaces
- Continuous work with abutters to determine any access benefits and/or impacts

- Compatibility with and connections to the I-195/Route 79 Interchange project limits
- Exploration of use of energy efficient PV (solar electric) panels along created MassDOT infrastructure or created parcels
- Further examination of U-turn bridge near Brightman Street for bicycle and pedestrian use
- Access to and potential for development of area near old Brightman Street Bridge

Design Elements

- Refinements to corridor alignment and layout
- Extensive use of Complete Streets principles
- Determination of sidewalk and shared-use path widths
- Use of low-maintenance vegetation as part of landscape design
- Introduction of lighting fixtures emphasizing historic character of Fall River
- Exploration of streetscape amenities and related funding sources
- Balance of on-street parking vs. surface lots or parking structures within development parcels